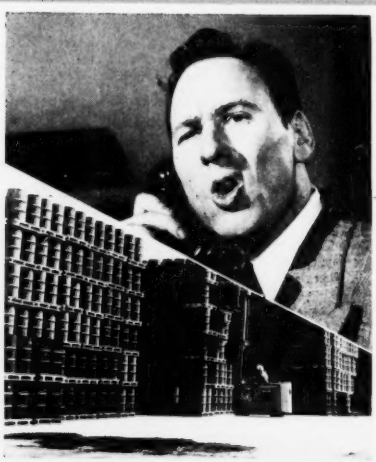
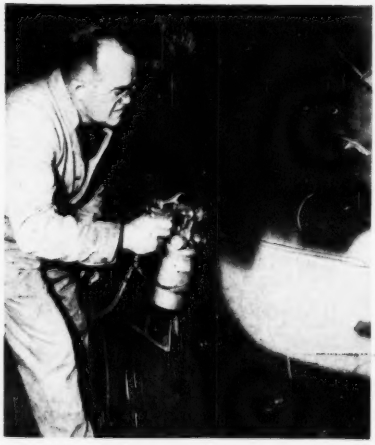
Chemical Week

August 11, 1951 Price 35 cents





Purchasing agents fret; reason: shortages, slow deliveries; here's today's situation . . . . . p. 9

Researchers uncover two new antimalarials; status: now being clinically tested . . . . . p. 19

Polyethylene "bottles" grow up to two-gallon size . . . . . p. 26

It's a trend: higher solids, better flow win converts to hot spray lacquers . . . . . p. 29

Permanents beating volatiles in antifreeze battle; supply outlook: ample . . . . . p. 39

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This interesting complex phosphate has decided advantages wherever extremely high solubility and sequestration of calcium, iron and magnesium ions outweigh first-cost considerations. A white, deliquescent powder Potassium Tripolyphosphate is not a substitute for lower priced sodium phosphates but it can be the basis for the development of finer liquid soaps, textile processing agents and sequestering agents.

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Chemical Week

Volume 69 Number 6
August 11, 1951

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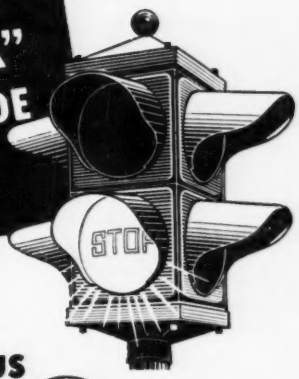
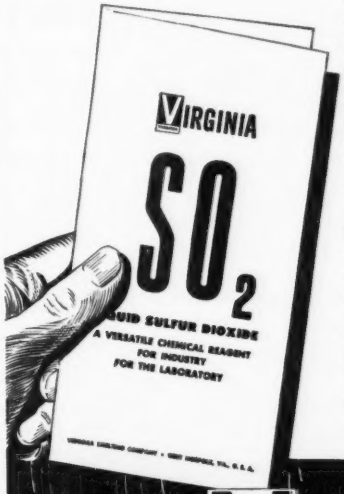
"VIRGINIA" SULFUR DIOXIDE DOES IT!



waste of precious Selenium STOPPED!

Selenium is a rare element. It has many important electrical applications; it is used for glassmaking. It does not occur in the pure state in nature, but is found in minute quantities in zinc and copper ores. It is hard to concentrate and separate from the reaction liquors in the refining of these metals. For years it was discarded as waste.

Our engineers found that soluble selenium salts are reduced in the presence of "Virginia" Liquid Sulfur Dioxide (SO_2). Elemental selenium is precipitated from the smelting liquors, and can readily be collected.



Thus another valuable element is made available to industry through a "Virginia" product and "Virginia" procedures. In the past 30 years, more than 40 diverse industries have found it advantageous to make free use of "Virginia" SO_2 and "Virginia" know-how stemming from long experience.

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VIRGINIA Chemicals

FACTS about PROPYLENE GLYCOL U.S.P.

PROPYLENE GLYCOL, U.S.P., made by The Dow Chemical Company, is a product of consistent, high purity prepared specifically for tobacco, food, drug and cosmetic use. The fact that it meets the high standards required for inclusion in the United States Pharmacopoeia indicates its applicability to pharmaceutical preparations, as well as to foods and cosmetics.

To assist you in evaluating the functions of propylene glycol, U.S.P. in your product, Dow presents the following information on a number of practical uses for this highly efficient chemical. Despite current shortages, Dow continues to be interested in helping you solve your production and experimental problems.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

PROPERTIES and General Uses

An outstanding characteristic of propylene glycol, U.S.P. is its solubility in all proportions in water. Moreover, it will dissolve and put into water solution many organic chemicals. Thus, it is widely used in the preparation of foods, flavors, cosmetics and pharmaceuticals.

Propylene glycol is also an extremely effective softening and moistening agent, as indicated by the hygroscopic quality of water solutions containing large amounts of the chemical, plus its characteristic plasticizing action. As a moisture control agent, it is used in tobacco for cigarettes. Propylene glycol also inhibits mold growth. It is used to extend the shelf life of certain foods, as well as to prevent mold contamination of idle food machinery.

ADVANTAGES OF PROPYLENE GLYCOL, U.S.P.

1. Odorless
2. Relatively tasteless
3. Low volatility
4. Acceptable in foods
5. Emulsifying aid
6. Wetting agent
7. Humectant
8. Preservative
9. Plasticizer
10. Excellent solvent

DOW PROPYLENE GLYCOL, U.S.P.

Conforms to or exceeds the specifications established by the U.S. Pharmacopoeia XIV (1950)

INTERPRETATION OF U.S. PHARMACOPOEIA SPECIFICATION

Specific Gravity @ 25/25°C.	1.035-1.037
Distillation Range (Method 2 U.S.P. XIV) I.B.P.-D.P.	185-195°C.
Identification	Passes Tests
Ash	Not more than 0.007%
Acidity (As Acetic Acid)	Not more than 0.0115%
Chloride	Not more than 0.07%
Sulfate	No Turbidity*
Heavy Metals	Not more than 5 p.p.m.
Arsenic (as As_2O_3)	Not more than 2 p.p.m.

*Method: Dilute 5 cc. of propylene glycol with 15 cc. of distilled water and add 5 drops of Hydrochloric Acid and 5 drops of Barium Chloride T.S.

This is No. 3 of a series of Dow advertisements you may wish to keep on file for reference and information. Write Dow for reprints.

Propylene Glycol in FOODS

Because of its solvent, preservative, hygroscopic and wetting properties, and especially because of its economy in use, propylene glycol has found wide acceptance in the food field. Apparently, the only class of flavoring raw materials not sufficiently soluble in propylene glycol for the practical preparation of flavor solutions is the citrus oils. However, by using edible wetting agents, it is possible to prepare a 5% orange oil colloidal dispersion in propylene glycol which, to all appearances, will be a solution.

In addition to the preparation of flavor solutions, propylene glycol, U.S.P. is being used as a solvent for the extraction of vanilla flavor from vanilla beans and also in the preparation of a coffee flavor from ground roasted coffee. As a corollary to the flavor use of propylene glycol, many manufacturers have found that it makes an excellent food color solvent and that its use necessitates only very slight alterations in basic food color formulas.

Another interesting and relatively undeveloped use of propylene glycol is in increasing the effectiveness of shortening in the production of baked goods. Apparently the emulsifying or wetting action of the chemical aids in the dispersion of the shortening throughout the batch, thus permitting the use of reduced amounts of shortening. Much investigation remains to be done on this phase of propylene glycol use, but it is apparent that a definite benefit can be obtained.

Being a hygroscopic material, propylene glycol in sufficient concentrations tends to attract moisture from the air and, as a result, baked goods, to which a very small proportion of propylene glycol has been added, have a considerably enhanced shelf life.

This preservative action, so apparent in the use of propylene glycol in baked goods, points logically to its use in other food products which require a preservative. Actual laboratory tests have shown that a 15% concentration of propylene glycol will inhibit the growth of mold on nutrient media, and it is quite possible that a smaller concentration would retard the growth of spoilage organisms under less ideal growing conditions.

Although the subject has not been fully explored, there is reason to believe that many solid foods can be placed on the market in better condition through the use of small quantities of propylene glycol.

PHARMACEUTICALS

The same qualities which make Dow propylene glycol, U.S.P. useful in food and flavoring preparations can be of great assistance in preparing pharmaceutical formulas. Here it acts as a carrier, solvent, emollient, humectant, lubricant and preservative.

The manufacturer of pharmaceutical preparations, whether for internal consumption, topical application or injection, must first solve the problem of finding a solvent which, in addition to being a good carrier, forms an acceptable medicinal. Propylene glycol, U.S.P. has been used in many approved pharmaceutical preparations and, in many cases, its preservative action is of considerable importance.

The versatility of the solvent properties of propylene glycol, U.S.P. applies to many organic chemicals used in the field of chemotherapy. Its use therefore should be considered in many estrogens, antiseptics, salves, elixirs, ointments and other types of pharmaceutical preparations.

COSMETICS

Dow propylene glycol, U.S.P. is used as a carrier, emollient, humectant, and preservative in many types of cosmetics. A great number of manufacturers of creams, lotions and similar products have discovered the advantages of propylene glycol's soothing and softening effect without residual stickiness. Propylene glycol can often be used in place of a more expensive ingredient and often will yield a superior product. In many cases, the addition of propylene glycol requires only a very slight change in the old formula to provide a high quality cosmetic.

Propylene glycol has been found effective in the preparation of lotions (whether non-alcoholic, mildly alcoholic or strongly alcoholic), cold creams and "all purpose" creams, hormone creams, vanishing creams, practically every type of facial make-up, permanent waving solutions and wave set solutions, shaving creams, soaps, shampoos and sun tan preparations.

This material is presented for what assistance it may give and is merely to be taken as indicative of the characteristics of DOW propylene glycol, U.S.P. and is not to be construed as specific recommendations.

WRITE DOW FOR INFORMATION AND TECHNICAL ASSISTANCE.

The Dow Chemical Company, Dept. OC-16,
Midland, Michigan

☐ **Please send_____ reprints of this advertisement.**

☐ **Please send me additional literature about propylene glycol, U.S.P.**

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Company _____

Address _____

City _____ State _____

DOW

CHEMICALS

INDISPENSABLE TO INDUSTRY AND AGRICULTURE

OPINION . . . . . .

Blackest Light?

To The Editor: As a subscriber of s me years standing to your journal I have come to have considerable respect for your accuracy, fairness and objectivity in reporting the news. However, it does seem to me that you departed drastically from objectivity in your piece on sulphur (The Way of Sulfur, June 23) . . .

Your discussion of the sulphur situation has, in fact, aroused a good deal of discussion here and I instance the comments of our British journal *The Chemical Age*. My belief is that you would care to consider printing these comments; indeed, I should think that you would regard it as the properly fair thing to do. This is what *The Chemical Age* opined in its edition of July 21:

"It is undoubtedly and regrettably the policy of some sections of the U. S. technical press to present British sulphur requirements in the blackest possible light . . . to make Britain a scapegoat for the sulphur shortage. (An article which appeared in some magazine other than CW was cited; the following does, however, refer to a CW editorial–Ed.)

"In another recent article–a leader – British requests for sulphur were compared with imaginary requests for $2,000 U. S. cars. Such cars being cheaper than Daimlers at $3,000, if allocated to Britain on a basis of so much percent of American production would save British buyers $1,000 per car."

"An argument of this nature is no contribution to Anglo-American understanding. Cars are made in both countries; but sulphur is not produced in both countries. The readers of technical and scientific journals in the United States must surely realize that it takes time to convert large plant from the use of sulphur to the use of other sulphur-containing materials."

"One conclusion is only too clear. As the allocation system for sulphur to American users tightens–and this seems generally expected–exports to Britain will become more and more unpopular. Any evidence or suggestion that we are losing time in introducing sulphur economy will make it acutely difficult for NPA to provide export allocations on a reducing and minimum requirement basis."

"It is essential that our efforts to use materials other than sulphur manufacture should be publicized in the United States. If American papers will take the trouble to investigate the matter they will find that Britain is doing its utmost to find alternative sources of sulphur and to save on its consumption."

"We do not object to fair criticism but we can and do expect fair treatment from all reputable journals."

R. L. Morecroft
Birmingham, England

We are grateful to Reader Morecroft for his observations and those of our esteemed British contemporary, welcome the opportunity to present their views. But this we think should–in all fairness–be said: (1) CW denies departing from objectivity in reporting the news, would like to point out that the article referred to was not a news report but rather an editorial–clearly labelled as opinion–written (and signed) by CW's Editor Alec Jordan. (2) the automobile analogy cited was robbed of meaning, lent itself to misinterpretation, by being taken out of context.

Far from putting the British position in "the blackest light" here is the nub of what CW contended (and contends): A good many countries (Great Britain included) **have been laggard** *in converting facilities to the use of pyrites. One of the reasons, in the case of England: there is little incentive for business enterprise under a socialist regime.*

Unfortunately ignored in the comments made were CW's statements "Some countries, even as Great Britain **is now at long last doing,** *are making efforts to adapt their economies to the sulfur shortage . . . others . . . are being dilatory. The laggards must be prodded, cajoled, urged to look ahead . . . not to rely on an ever-bountiful supply of U. S. brimstone."*

Not to be Overlooked

To The Editor: Your editorial discussing the sulfur supply (The Why of Sulfur, July 14), brings to mind a point that is too frequently overlooked in the many discussions of the critical sulfur situation. It is true that the present demand for sulfur is exceeding our supply from the cheapest source, namely sulfur wells.

This, of course, has brought about a marked advance in sulfur prices. However, sooner or later the old law of supply and demand will have raised the price of sulfur to the level where voluminous other sources of sulfur may be tapped. At this point, the price of sulfur should be levelled off . . . because of the adequacy of the supply.

It is believed that this assumed fact should be more frequently mentioned to eliminate the feeling of fear on the part of many people who have failed to recognize such a possibility.

Wm. W. Niven, Jr.
Chairman
Chemical Engineering Division
Midwest Research Institute
Kansas City, Mo.

True. Brimstone may be short but there is no dearth whatsoever, nor will there be, of sulfur-containing raw materials.–Ed.

Scratch: Pure

To The Editor: . . . We have read your article Coming: Tougher Food Law (July 14) . . . would like to express our deep interest in and favor for such articles.

. . . There should be more articles of this nature in more magazines so that the public might at least be exposed to both sides of the story.

The only objection we have is a technical one, has nothing to do with the context. We note that the term "Pure Food and Drug Act" is used in the second paragraph. The correct title of the act is the Federal Food, Drug and Cosmetic Act. The term "Pure" in connection with such acts remains only in the title of comparatively few state laws.

F. Dallas Sparre
E. I. du Pont de Nemours & Co., Inc.,
Wilmington, Del.

Organized Confusion

To The Editor: This is the second time in my life that I have written a letter to the editor but just cannot seem to resist this one. Everywhere I read about chemicals in food AND everywhere I read about Regional Laboratories working on chemicals for foods.

For instance this week glyceryl monostearate from soy oil for use in foods. What are we doing? Spending money with the left hand and prohibiting the use of the results of this expense with the right.

Too damn many bureaus, too damn much politics. Organized confusion, that's Washington.

V. F. Harrington
West Hanover, Mass.

Could be.–Ed.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.
Address all correspondence to: The Editor, Chemical Week, 330 W. 42nd St., New York 18, N. Y.

NEWSLETTER

Who said what about wool substitutes has now reached the whodunit category. Wool men bellowed with rage at Economic Stabilizer Eric Johnston's alleged statement that "synthetics will do to wool what nylon did to silk," and that the Government would underwrite a synthetic fibers program. Now Johnston's office denies that he said it—and persuasively, since ESA does not directly set policy for loans or construction.

But Defense Mobilizer Charles Wilson and other defense officials—who do establish policy—are definitely sold on synthetics.

Don't expect immediate action on fast write-offs for specific plant proposals. That will come later, but first a general statement of policy—undoubtedly favorable—will be issued.

However large the synthetic fibers industry becomes, and whether it receives considerable, little or no Government encouragement, it's a safe bet that even the threat of substitution will effectively prevent wool price gouging. Indeed, the Navy took credit last week for breaking wool prices by its substitution program (CW, July 21).

National Production Authority is now wrestling with the problem of what to do about companies which augment their sulfur supplies by installation of recovery units. Should the additional sulfur revert to the common pool for allocation (in which case there's no incentive to invest in recovery units) or should it be a "bonus" supply?

Policy will be set soon—and it will probably allow firms who recover sulfur to use it themselves—in addition to allocations.

Diamond Alkali is boiling with activity this week as plans jell: It will produce vinyl chloride monomer near Houston in a joint venture with Shell Chemical. Shell will supply the ethylene, Diamond the chlorine, and the product will be split 50-50.

Insecticides and herbicides are also on Diamond's "must-do" list. It acted this week by making arrangements to purchase Kolker Chemical Works. Diamond already supplies chlorine for Kolker's DDT and benzene hexachloride production at its new Houston plant.

Slated for October occupancy is a new engineering and research center at Painesville. Management—impressed by such earlier accomplishments as chlorinated waxes—is now putting more emphasis on research.

Good public relations and a real boost for victims of the Kansas flood: Pharmaceutical firms, including Lederle Laboratories and Parke, Davis, are replacing free of charge drug stocks lost in the disaster. Field representatives are helping druggists take inventory, enabling speedy replacement and minimizing danger of epidemics.

Canadian firms are looking to early manufacture of acrylonitrile, now used in sizable quantities for acrylonitrile-containing rubber but not made in Canada. At least one firm is actively considering production.

Good bet on process: addition of hydrogen cyanide to acetylene.

Industrialists in the Pacific Northwest are cocking a weather eye at the sky. It's been too cloudless for their peace of mind, and unless heavy rains come soon, electric power—dependent on damned-up rains—will have to be rationed later this year.

Utility men sat down with Government officials to prepare for the worst. The Government wanted a list of industries whose power could be cut off. But the power men—reluctant to lose friends—tossed the ball back to the Government.

The utility men would probably prefer to reduce power to the aluminum industry, largest user but employer of only 6,000 workers. But the Government won't touch aluminum output—and the result is that other industries employing 150,000 are threatened by the potential shortage.

The Government wants further aluminum expansion—provided it's by the right people (See p. 16). Now Curtiss-Wright and another unnamed firm have reportedly applied for certificates of necessity for a 200-million and a 120-million pound plant, respectively.

Whether the projects go through or break up on the shoals of high cost is a moot point. Lack of cheap hydroelectric power is a factor.

Speaking of costs and prices—look for OPS to drag its heels on granting price increases under the Capehart amendment (see page 12).

First of all, chemical companies will have to complete their filing under CPR-22 if they haven't done so. Only then can they apply for adjustments. Then OPS plans to demand applications on an individual basis—even though it knows it can't possibly handle them this way.

By sitting on applications, OPS may force a Congressional appropriation for more workers, but in view of the tight labor supply it would be impossible to round up 10,000-to-15,000 workers—even if the money were forthcoming. Thus industry is in for "control by stagnation."

If and when price adjustments do materialize, look for some increase in the price of petrochemicals—but not as much as might be expected. Producers don't see any practical way to allocate increased costs of crude oil and natural gas to any specific products.

But industrial expansion barrels along despite price uncertainty: Harshaw Chemical Co. is now spending $100,000 to expand its Elyria, Ohio, plant. Product: synthetic optical crystals.

Location was not specified in Davison Chemical's application for a certificate to cover its $5 million catalyst plant. It will probably be at Lake Charles, La., where the company has just bought land.

Cancellation of tariff concessions to Czechoslovakia won't make a great deal of difference to the U.S. chemical industry. The Czechs never exported more than about $300,000 worth of chemicals to the U.S. Principal items: potassium permanganate, sodium hydosulfite, and Van Dyke brown pigment.

Who owns I.G.? The State Department and High Commissioner for Germany is more anxious to find out than to prosecute those who traded in the stock. State has asked owners to report their holdings, promise immunity to those who bought and sold illegally.

. . . The Editors

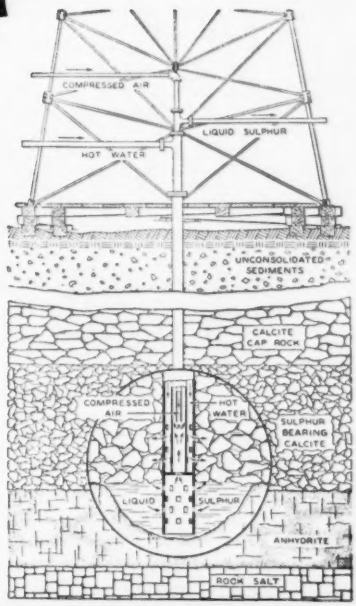
SULPHUR

*Interesting Facts Concerning This Basic Raw Material from the Gulf Coast Region

*WELL PIPING

The well equipment consists of pipes of various sizes, placed one within the other and extending from the surface into the sulphur deposit. A 10" or an 8" casing extends to and rests on the top of the cap rock. A 6" pipe, inside the casing, passes below it and reaches into the barren anhydrite. It is perforated at two different levels, separated by an annular collar. The upper set of perforations permits the hot water to enter the sulphur formation and the lower set permits the entrance of the molten sulphur to the discharge pipe fitted inside the 6" pipe.

When a well is "steamed" the hot water passes down the annular space inside the 6" pipe and outside the sulphur pipe and flows through the upper set of perforations into the porous formation. The entire mass through which the hot water circulates is raised to a temperature above the melting point of sulphur. The liquid sulphur being heavier than water, makes its way downward to form a pool and displaces water around the foot of the well, and rises in the well column through the lower perforations into a 3" pipe which is the sulphur discharge pipe. Compressed air released at the bottom of still another pipe fitted inside the 3" pipe rises and mixes with the sulphur column, forming an air lift which raises the liquid sulphur free of water to the surface.



Loading operations at our Newgulf, Texas mine

TEXAS GULF SULPHUR CO. INC.
75 East 45th St. New York 17, N. Y.
Mines: Newgulf and Moss Bluff, Texas

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A. R. MAAS CHEMICAL CO.
Division of Victor Chemical Works
4570 Ardine Street, South Gate, California

A R M M

VICTOR CHEMICAL

August 11, 1951 • Volume 69 • Number 6

Chemical Week

BUSINESS & INDUSTRY . . . . .

Buyers Hunt Shy Five

Sulfur, chlorine and associated compounds head tough-to-get heavy chemicals list according to poll of buyers.

CW survey also finds tight supply of stainless steel equipment, electric motors plaguing purchasing agents.

Container troubles center about metal drums, bags; government regulations viewed as doubtful help.

These are times that try chemical purchasing agents' souls. This fact was undeniably established by CHEMICAL WEEK as it polled chemical P.A.'s across the nation on the vital question: What chemicals, equipment items and containers are hardest to get these days?

Answers to the CW on-spot quiz show that a definite overall shortage pattern exists that can be called characteristic of the industry as a whole. Also found, however, are specific shortages in certain specialty or low volume chemicals and minor equipment items that are regarded just as serious by the companies that need these materials in their manufacturing operations.

First Place Tie: As expected, sulfur and chlorine tied for first place on the list of tough-to-get heavy chemicals. Almost every company replying to the CW poll lists these two commercial staples high on their "wanted" docket. And associated sulfur and chlorine compounds figure prominently along with their parent elements in the tales of shortage woes. Most noticeable by their presence are sulfur dioxide, sulfuric acid, sulfites, sulfates and carbon tetrachloride, hydrochloric acid and methylene chloride.

Caustic soda, and soda ash are anything but also-rans in the contest for first place in the shortage list. The same is true of napthalene and in many cases, benzene.

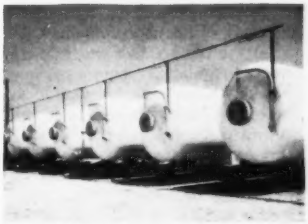
Second Division: After the first group of "toughies," reported in the survey, comes a second that includes phenol, acetic acid, aniline, hydrogen peroxide, cyanides, bichromates and a bevy of barium compounds that include the oxide, hydroxide, carbonate and sulfate.

Also mentioned in many reports from harassed buyers are formaldehyde, phosphates, phosphorus and certain copper compounds. In most of these cases the shortages seem to be sectional rather than national in their occurrence and impact.

Equipment Shortages: Stainless steel production units are named only a little more frequently than electric motors by chemical P.A.'s as the items hardest to get in equipment lines. Next in magnitude of difficulty, according to the men who buy, are steel pipe, barstock, angle, wire and even nuts and bolts. Copper wire and control instruments follow these materials as the next most difficult to procure.

Container Crux: A large number of headaches due to container shortages is revealed by the CW survey. Most of the pain stems from a lack of metal drums and cans. But some of it is attributed to shortage of paper bags that seems to plague a number of P.A.'s. Polyethylene linings are also scarce for the company with packaging needs. Similarly a tight situation in carboys has added to the woes of purchasing departments almost everywhere. Glass containers are reported by the survey to be surprisingly easy to come by although some local shortages exist in this item.

Do Regulations Help? Most purchasing agents take a kind view toward government regulations as a possible means of resolving their plight with regard to shortages. At least they give them A for effort. In many cases however, plain old fashioned cuss-words are used by P.A.'s to describe their opinion of DO-MRO-5, and M-75, the two government orders found most unpopular by the CW poll. Only three companies polled had any nice words for M-75, claiming that it takes a realistic view of the container situation. Other opinions are not for print.



CHLORINE

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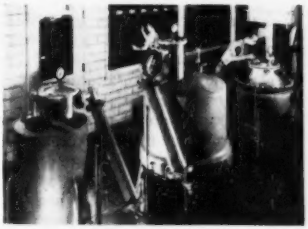
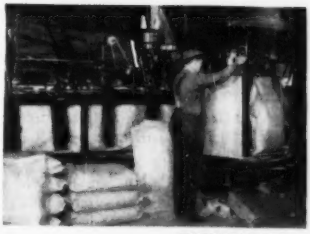


STEEL EQUIPMENT

METAL DRUMS



PAPER BAGS

CMP regulations were slammed heavily in a few quarters. One sweating P.A. exploded: "They (CMP) allot something they hope is there . . . like writing a blank check and hoping the money is in the bank. Our construction program flopped completely as a result of this shortsightedness."

But the big squawk was that government regulations require too much "blankety-blank" paper work. Said one buyer: "It now takes me as much time to place one order as I used to need to place twelve . . . and then I'm not sure of getting delivery . . . whatta mess!"

Closer to Customer

Coal chemical middle men will lose a major supplier when Inland Steel Co., Chicago, completes organization of a new sales department for selling its coking by-products directly to the consumer.

Harold J. Kreher, formerly assistant manager of the Railroad, Pig Iron, and Chemical Division of Inland, was selected early this month to head the new department that will bring the company into large-scale direct sale of chemicals for the first time. Heretofore, only the company's creosote was sold in this way.

The major decision, after more than 40 years of selling through agents, is based largely on the prospect of added profits for the company by direct selling.

The company moreover sees a strong possibility of raising potential profits still further under the new set-up. Reasons: (1) rigid controls and processing improvements resulting from closer production-consumer ties; (2) better service and closer customer cooperation under a direct-sales system. J. L. Block, vice-president in charge of sales, has indicated that the radical shift was influenced mainly by the increasing use and growing importance of coal chemicals resulting from new developments based on these chemicals.

The shift, started early this year, will be completed in the near future. Change has been necessarily gradual. Rapidity of the change-over depends largely on the material involved, since many of Inland's products are contracted to agents until the first of the year. By the end of 1951 the company expects to be in full operation in the new department.

Sales Set-Up: Inland's sales field is still somewhat limited, but includes representative companies in each field of coal chemical consumption. At present sales are made only from the Chicago home office, but if volume demands it, Inland has a ready-made sales machinery in its existing regional steel distributing offices. It is simply a matter of attaching salesmen to these offices.

BLOCK: Direct sales for more profit.

At Inland's East Chicago works 418 by-product coke ovens carbonize about 3¼ million tons of coal per year to provide coke for the blast furnaces. This adds up to an annual output of some 33 billion cubic feet of coke-oven gas.

From these ovens Inland gets the major products to be sold by the new division: tar (creosote oil, tar acids, naphthalene, pitch), ammonium sulfate, crude pyridine, sodium phenolate, and light oils (benzol, toluol, and xylol).

Isolation, Not Enough

Isolation and identification of a new compound from a material known to have the same general properties as the isolated compound is not patentable. If the isolated component has properties differing markedly from those of the substance from which it is being isolated, a patent can be granted.

This is the gist of a recent decision of the Board of Appeals of the U. S. Patent Office (ex parte Cavallito, 89 USPQ 449).

Allyl disulfide oxide was claimed as a new compound by Chester J. Cavallito of the Sterling-Winthrop Research Institue. But he produced it by treating ground garlic with a water-miscible organic solvent, such as methyl or ethyl alcohol. A vacuum distillation serves to remove the solvent from the extracted disulfide, which is separated from the residue by a steam distillation.

The Patent Office Examiner allowed claims for the process but he rejected the claims wherein the disulfide was claimed as a new compound. Its use was set forth as an antibiotic and it was claimed in terms of molecular and structural formulas, as well as in terms of physical properties such as refractive index, density and solubility in water. The specifications pointed out that the isolated disulfide had about 400 times the antibiotic activity of the ground garlic cloves.

The Board of Appeals stated that:

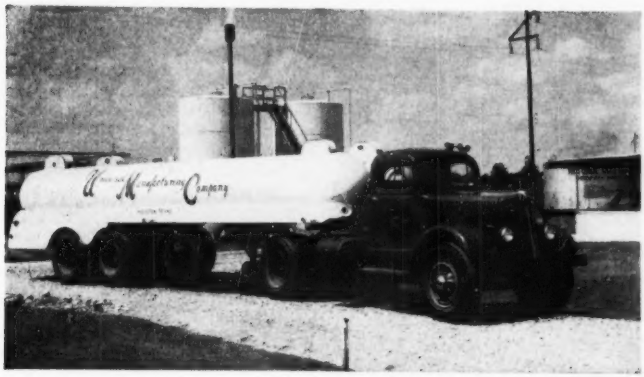
(1) since the applicant extracts the compound from the garlic by a simple solvent extraction ". . . we are satisfied that the Examiner's assumption that this compound exists as such in the ground garlic is well founded,"

(2) it is also clear ". . . that the antibiotic properties of the compound in question are not unobvious, because the appelant admits that ground garlic is recognized to possess bactericidal and antibiotic properties."

Concluded the Board: "After studying with great care the decisions . . . we are constrained to hold that the weight of authority is to the effect that under the conditions involved in the present case, the isolated component is unpatentable. . . . We are constrained to hold that the stability of the compound claimed does not lend any patentable merit to it; and that the identification of the compound by its apparent chemical formula does not render it patentable. The rejection of the compound claims . . . as unpatentable over the natural substance found in the crushed garlic will, therefore, be sustained."

This decision does not mean that the Patent Office will not grant patents on new antibiotics. It will, but only on those cases where it was not known that the antibiotic was produced in the natural habitat of the organism, or that the natural medium in which the organisms grow had antibiotic properties. The same policy would apply, of course, to other naturally occurring materials as well as antibiotics.

The criterion for patentability for a product extracted from a natural source appears to be: (1) discovery of important useful properties for the isolated product; and (2) non-recognition or non-availability of these properties in the crude substance from which the product has been isolated.

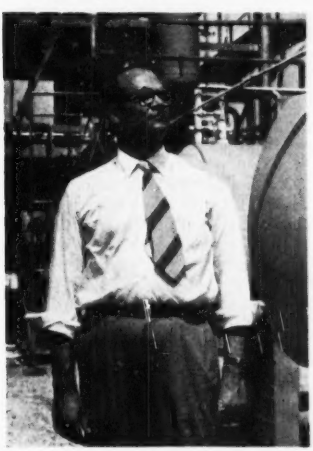


TRUCKING TRIUMPH: Odorous traveler, methyl mercaptan, now rides in style.

Malodors: $Million Market

Manufacture of highly offensive odors is a thriving business at Houston's Natural Gas Odorizing Co. In an exclusive interview last week, CW found energetic young company president C. E. Gill happily sitting on a veritable gold mine. Figures: from an initial capitalization of $1,600 in 1942, the company will produce this year an estimated million pounds of chemicals to make gas smell bad, at a selling price of 1 dollar per pound.

The world's only exclusive manufacturer of gas odorants grew directly from president Gill's long association with gas odorization. Working on gas distribution for a Baton Rouge utility company while still a student at Louisiana State University, Gill quickly saw the possibilities in gas odorization. Soon after graduating he went to work on gas odorization and chemical sales for Sharple Solvents Corp.



C. E. GILL: Mercaptan magnate.

When World War II cut the need for salesmen, Gill took a compound of his own formulation and went into the gas odorizing business. Demand increased so rapidly that a plant had to be built, and, with two partners, Gill founded the present company. By 1945 a plant and office building had been constructed in Houston at a cost of $28,000. Early this year it became necessary to enlarge facilities until capacity is now double the original figure. Sales have grown from 60,000 pounds in 1942 to an estimated million pounds this year. Market is entire U.S., Mexico, and Canada, although the company is not active on the west coast.

Starting with a single product, Captan, (containing mercaptans, alkyl phenol, and sulphides) production has considerably expanded. Says Gill, ". . . we have found that no one compound will answer all needs for gas odorization . . . our success in the field is premised on the fact that we are able to recommend the correct odorant, the proper equipment, and the best concentration." He maintains the company's success is based largely on its trained gas distribution men.

Problems a Specialty: Typical of Gill's know-how with malodorous chemicals are two recent major developments: a new compound to replace ethyl mercapton and the first ICC approved tank truck for transporting methyl mercaptan.

Constantly looking for worse smells that last longer, the company has found a compound to replace high-smelling, but easily oxidized, ethyl mercaptan. Under the conditions of use of light petroleum gases to make 1350 Btu gas for cities, ethyl mercaptan is quickly oxidized to the relatively odorless disulphide. Hence the new oxidation-resistant compound.

Second major development was shown successful when the new tank truck made its maiden journey this month with a load of methyl mercaptan, heretofore banned from the highways. When economics showed that tank-trucking is the best method for shipping the disagreeable material, Gill, and the engineers of his second Houston company, Universal Manufacturing Co., went to work to build a truck that could do the job. By designing a strong and light tank with maximum safety and minimum leakage, pressurized, and fitted with a unique unloading system that utilizes dry, oxygen-free, exhaust gas, Gill snagged the first and only ICC permit to truck the foul chemical.

Primary Markets: Major market for the company's products is the natural gas industry. Odorizing gas is mainly a safety factor for cosumer use of the odorless natural gas.

Second major use for company's odorants is in odorizing light petroleum gases. (Here the new compound is expected to expand the market). Other uses for the company's products include such things as: detecting hot bearings on journal boxes of railroad trains, locating leaks in refrigeration piping, and as a warning in air circulated mines.

Specialized Field: Despite the fact that only four states require gas odorization, it is a generally accepted practice. Since one-half pound of odorant is sufficient to odorize a million cubic feet of gas so that it is easily detected, odorizing is a small field. But it is a highly specialized field, and gives fat returns for the know-how.

Total market, estimated at 1,600 billion cubic feet of gas per year at 50¢ per million cubic feet, has enabled Gill to realize a rich return from his long attention to nauseous odors.

Current List of DPA—Certified Chemical Facilities

COMPANY	LOCATION	PRODUCT	AMOUNT ELIGIBLE	PERCENT
Brown Co.	Berlin, N. H.	Sulphur dioxide	$ 548,800	80
North American Refractories Co.	Mount Union, Pa.	Silica brick	130,803	85
Texas Eastman Co.	Longview, Texas	Butyraldehyde	6,301,685	50
Gulf Oil Corp.	Port Arthur, Texas	Iso-octyl alcohols	704,756	80

New Price Law: Boon or Bane?

President Truman last week "reluctantly" signed into law the new price control bill, including the controversial Capehart amendment. This law recognizes costs to chemical producers which had been ignored under CPR-22. To clarify the picture of what manufacturers may expect under the new law, CW interviewed Samuel Nakasian, Washington attorney and former price chief of the Economic Cooperation Administration. Nakasian is author of the report, "CPR-22: Prices Via Costs"—CW, June 23.

CW: Mr. Nakasian, Does the Capehart Amendment in your opinion require change in the language of CPR-22?

Nakasian: Not according to the interpretation put on the amendment by OPS. Manufacturers are subject to all controls as written into CPR-22 despite the later passage of the amendment.

CW: Well, then, what effect does the Capehart amendment have on prices?

Nakasian: For manufacturers producing at greater levels than in the base period, probably none, for the reason that many of the allowable costs added by the amendment would not rise at the same rate as production. For chemical companies operating at or below base-period levels, it will allow them an increase in prices in recognition of the total cost increase.

CW: You mentioned base period. What is this term as it refers to the Capehart amendment?

Nakasian: The period from Jan. 1 to June 24, 1950. This is different from the base period under CPR-22—last two quarters of 1949 and the first two quarters of 1950.

CW: What effect does the Capehart amendment have on the definition of allowable costs set in regulations?

Nakasian: Under CPR-22, recognition of cost is limited to factory payroll and direct material. Under the amendment, practically all costs except taxes and interest are recognized.

CW: Is the Capehart amendment a formula which recognizes only cost increases?

Nakasian: No, the amendment provides for recognition of decreases in costs as well.

CW: When, in general, should a manufacturer apply for adjustment under the Capehart amendment?

Nakasian: It will serve a useful purpose when he can demonstrate his total cost is a greater percentage of sales now than during the base period.

CW: Under CPR-22, a manufacturer could ask for relief only if he showed a loss on his whole plant—not on single product lines alone. Will the Capehart amendment now allow a manufacturer to ask for higher prices on a product line, or only on his entire output?

Nakasian: That is still open to question. OPS probably will resist any interpretation that would allow price determination on anything less than a manufacturer's over-all operations.

CW: Does the Capehart amendment introduce a more realistic basis for price control?

Nakasian: It may be more attractive because of its liberality, but it does not change the basis of price control. Rather, it goes a long way towards legislating price-fixing on the basis of costs. For most industries, price-fixing on this basis is alien to normal business practices, where price levels and the interrelation of prices among commodities and sellers are fixed by market forces.

CW: Will this new amendment make any difference in the amount of paper work for manufacturers?

Nakasian: Yes. It will mean an increase—maybe a substantial one.

CW: Under CPR-22, different manufacturers may have different ceilings for the same commodity. What effect does the Capehart amendment have on this?

NAKASIAN: "More paper work."

Nakasian: No effect. That situation remains uncorrected.

CW: Also, small firms were often put at a disadvantage competitively by this difference in ceilings. Will this allow them to raise their prices?

Nakasian: Only if they can demonstrate that their total costs are higher, as I explained before.

CW: Well, then, Mr. Nakasian, how will OPS administer this program? It seems as if there would be a tremendous increase in paper work.

Nakasian: At present, OPS is not staffed to handle any great volume of individual adjustment applications.

CW: So what is the outlook?

Nakasian: Most probably, OPS will issue a general overriding regulation permitting manufacturers automatically to establish new ceilings under the Capehart amendment. However, manufacturers will probably be required to report such increases—as they now do under CPR-22—and wait 15 days or so during which time OPS could object. The provision in the present law that the price could later be overridden would probably still apply.

CW: All in all, then, since chemical manufacturers were generally operating at capacity during the base period, wouldn't they benefit by applying for price increases?

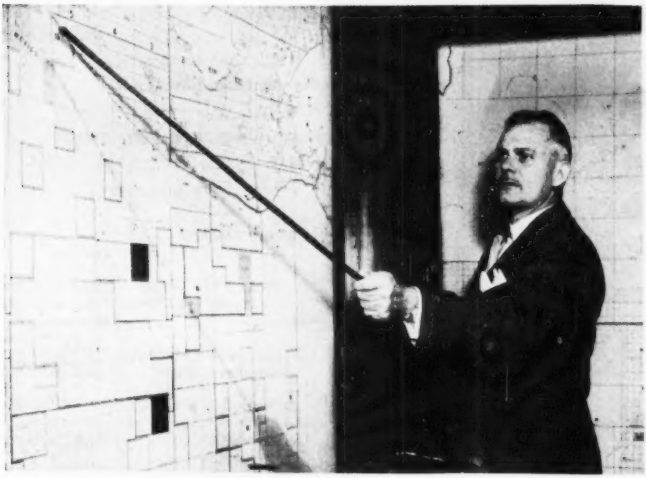
Nakasian: Definitely, yes.

Vats for PC&C

Color will soon be emerging from sooty Pittsburgh. Vat dyestuffs, which are derived from anthraquinone, are to be the first products of the new fine chemicals division of Pittsburgh Coke & Chemical Co. *(CW, April 28)*. These are to be followed in short order by a series of aromatic intermediates and other dyestuffs as P C & C develops its plans to form a complete and vertically integrated operation in the P C & C manner *(CW, July 21 p. 16)*—from raw materials supplied by its Neville Island coke ovens to the textile converter.

From a raw material point of view, Pittsburgh is in an excellent position. For example, all of the raw materials for anthraquinone production with the single exception of aluminum chloride are now being manufactured at Neville Island—phthalic anhydride, benzene and sulfuric acid. From the personnel point of view L. D. Barrick and R. M. Locke, both of whom were formerly working in the dyestuffs department of General Aniline & Film Corp. will supply the needed talent.

Operations will be initiated before the end of the year.



K. S. ADAMS: On a firm petroleum foundation, a chemical structure.

Accent on the Future

Now entering its fourth year of operations, Phillips Chemical is already a well established member of the chemical fraternity. But management is not taking time off to look at the record. On deck for the future: spanking new capacities for its present products, at least one new chemical.

The new product will be vinyl pyridine. Phillips, getting ready to crash what is apparently a lucrative market, will build a 2 million lb. per year plant costing $2.4 million. The site has not definitely been decided on but it will probably be located at Adams Terminal, near Houston, Tex. (site of present ammonium sulfate plant).

Reilly Tar & Chemical, present producer of vinyl pyridine, is turning it out in a healthy-sized pilot plant. Although rated at 500,000 lbs. a year, the plant is operating at less than capacity because of raw material difficulties. Reilly had been synthesizing the compound from alpha-picoline. That material, however, is in particularly tight supply; the company now starts synthesizing the picoline.

Phillips also will rely on almost a total synthesis, starting with acetaldehyde and ammonia. Officials won't state whether they will produce the vinyl pyridine itself or one of its alkylated derivatives. The latter would appear more likely from the starting materials.

In any event, the product is destined for synthetic fibers; it is used to make them amenable to acid dyes. Reilly estimates the potential market at between 5 and 10 million lbs. Du Pont and Chemstrand are reported to have heavy requirements for it.

Phillips has other plans that will solidify its position as a supplier of raw materials for synthetic fibers. It will spend $2.5 million to boost its cyclohexane production (Borger, Tex.) from 6 to 16 million lbs. a year. (On oxidation, cyclohexane is converted to adipic acid, an important raw material for the production of nylon.)

Not Enough: In 1948, its first year of operation, Phillips Chemical produced 26,000 tons of fertilizer. By 1950, production has risen to a thumping 400,000 tons. This year it is running well above that figure, but it is still not sufficient to meet the demands of customers. As a result, the company has applied for two certificates of necessity, one for increasing present capacity, the other for constructing a new plant *(CW, Aug. 4)*.

To supply its increased requirements of sulfur for fertilizer, Phillips is constructing a plant in Goldsmith, Tex. for extracting a quarter million lbs. of sulfur daily from sour natural gas. In addition, it is considering a second plant at another location *(CW, April 28)*.

In 1950, Phillips production of carbon black hit 180,000 lbs. A third plant is now being constructed at a cost of $5 million. Scheduled for completion early in 1952, it will up annual production to 290,000 lbs. Further expansion may be expected on the new SAF carbon black which is currently in the pilot stage.

Last year, Phillips assumed operation of the government-owned synthetic rubber plant (adjacent to its Plains butadienne plant, also government owned). A recent development by Phillips engineers in heat exchange equipment enabled the company to cut reaction time for rubber production from 14 to 8 hours. Management says this may permit the synthetic industry to get from 20 to 50% more production.

Petrochemicals: Phillips Chemical was formed when Phillips Petroleum leased the Cactus Ordnance works from the Army. Texas law required the formation of a separate operating company *(CI, Aug. 1948)*. At the time CI reported that Phillips Petroleum "could have set up a corporation called Phillips Petroleum of Tex. or something like that, but it chose to recognize its status and formed the Phillips Chemical Co., a wholly-owned subsidiary."

In 1950, the status of the chemical offspring: gross income of $43.5 million, or over 8% of the parent's gross. Board Chairman K. S. Adams limned the relationship between the petroleum and chemical companies when he called it "a great chemical structure on top of a firm foundation of petroleum raw materials."

Chemical Price Fixers

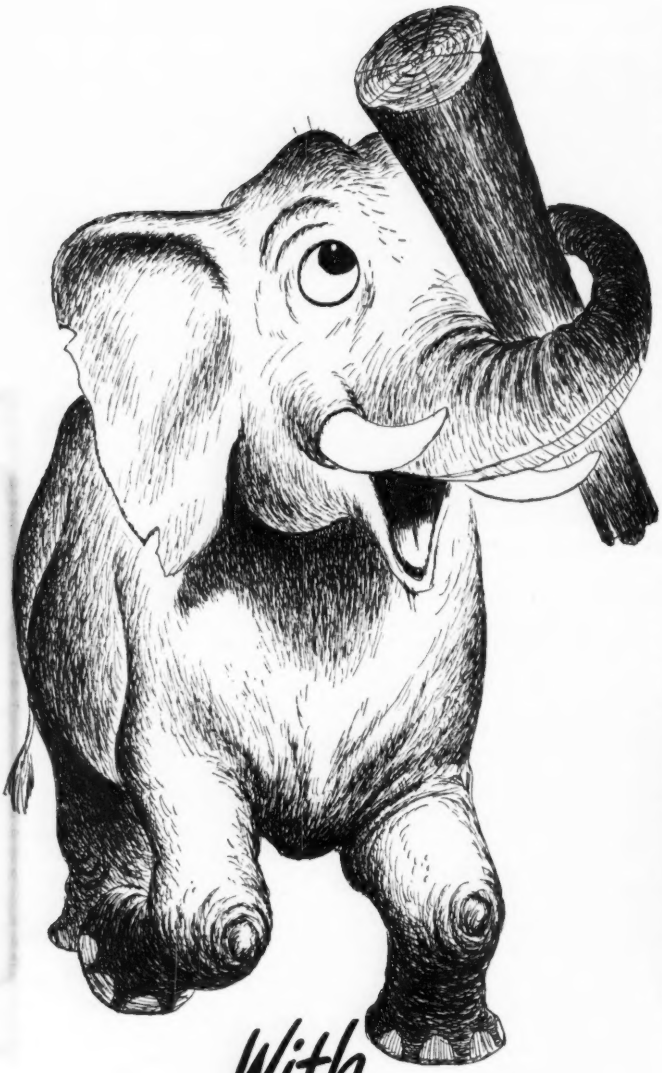
The Office of Price Stabilization is still very much in business. This is in spite of the fact that chemical sales executives have noted a slackening in the rate of issuance of new price orders.

Reason for the slowdown has been the congressional debate on the whole controls picture. Only when the dust has settled will OPS officials be in a position to chart the course of the agency for the next 12 months.

Personnel of the Rubber, Chemicals and Drugs Division of the OPS are most thankful for the lull in order issuing. Under the direction of their chief, Thomas McCormack, a sales executive of DuPont on leave to the government, they have worked at a hectic pace to keep OPS regulations rolling for the chemical industry.

Tough Job: McCormack's role itself has not been an easy one at OPS. As head of the Chemicals Division he has been a target for many slings and arrows from his fellow executives in the chemical industry who, in a perspiring way, are learning to live with price control.

Fortunately for himself and the OPS, McCormack's proclivity as an executive has worked to keep his



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TWO AT TOP: Director McCormack, assistant George Strasser evaluate a gripe.

group rolling smoothly in spite of stormy gusts from industry and congress on the proper application of price lids.

McCormack gets considerable help in running the chemical price picture from Acting Assistant Director George Strasser and a division counsel, Alfred Letzler, a government lawyer since 1934 and an expert in deciphering the meaning of "small type" in control legislation.

Industry men are frequently called upon by McCormack and his team for answers to straight questions involving the price background of given chemical or rubber products. But an inflexible rule is followed in such cases. No industry man is ever permitted to sit in on actual discussions involving products in which his firm is interested.

School for Executives: Perhaps the most unique feature in McCormack's operations is his "school for executives," This is a series of lectures set up to train industry people on loan to OPS in the intricacies of government workings.

In its sessions, the school teaches the theory of OPS, the basic reasons for regulations to be issued and the details of government procedure on many different points. This educational enterprise is run chiefly for the benefit of branch and section chiefs of OPS. But everyone employed in the Chemicals Division attends at least one class a week.

Manuals Too: In addition to the lecture method of training McCormack's division also uses the printed word route. A manual of rules and regulations has been printed to supply the "students" with main points covered in the lecture periods.

McCormack is quite proud of his educational institution. He feels that any of its graduates should not find government operations confusing at all. In fact, opines McCormack, it may be that the business is confusing OPS, as a result of his own confusion. . . . Its simple when its explained like that.

KEY CHANGES . .

John R. Mote: From medical director and assistant general manager, Armour Laboratories, to medical director, Research and Development Laboratories, Smith, Kline & French.

S. T. Keel: From manager, phosphate sales department of the southern district, to domestic sales manager, Phosphate Division, International Minerals & Chemicals Corp.

Stephen S. Hubbard: To manager of research, Davison Chemical Corp.

Philip R. Tarr: From assistant director of industrial preparedness, to assistant to the president, Monsanto Chemical Co.

David H. Conklin: To assistant director of sales, Petroleum Chemicals Division, Du Pont.

Donald H. Loughridge: From scientific advisor to the Secretary of the Army to assistant director, Division of Reactor Development, Atomic Energy Commission.

Leroy Donald: To sales manager, Chemical Division, Lion Oil Co.

Richard W. Goldwaite: To assistant sales manager, Chemical Division, Lion Oil Co.

J. Joseph Kelleher: To assistant director of sales, Explosives Department, Hercules Powder Co.

Charles Wirth III: To manager of wholesale sales, Kinetic Chemicals Division, Organic Chemicals Department, Du Pont.

Davis R. Dewey II: To vice president, High Voltage Engineering Corp.

H. R. Legatski: From superintendent of operations Phillips Petroleum, to project development engineer, Phillips Chemical.

L. Robert Vitkin: To vice president, production, American Flange & Manufacturing Co., Inc.

FOREIGN. . . . . .

Alaska: The Defense Production Administration has approved a $40 million certificate of necessity for a chemical pulp mill by the Ketchikan (Alaska) Pulp and Paper Co.

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Canada: Godfrey Cabot (Boston) is reported interested in the proposed $2 million carbon black plant in Sarnia, Ont. If the plant is built, it will be the first of its kind in Canada.

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Australia: More than $6.75 million will be spent by Imperial Chemical Industries of Australia and New Zealand to increase production of polyvinyl chloride. By 1954, the country may be independent of all foreign sources of supply of the compound.

EXPANSION . . . .

Lederle Labs: A contract has been let for the construction of a second new plant at Pearl River, N.Y. The two new buildings, to cost over $3 million, will permit tripling the present capacity. Schedule calls for completion in 1952.

•

Davison Chemical: A report from the Southwest says that the company will build a $5 million petroleum cracking catalyst plant on the Gulf Coast. Davison management, however, says it is too early for official comment.

•

Bristol Labs: The company will build a multi-million dollar plant for pro-

ducing streptomycin. Expansion will include a new administrative building and additions to plant facilities for fermentation and extraction equipment. Philip I. Bowman, executive v. p., said the exact cost had not been determined, but that streptomycin production would be on a "substantial scale."

•

Witco Chemical: Completion of two new facilities will enable the company to step up research activities. In Chicago, a new wing on the laboratories has doubled research facilities. And in Amarillo, Tex., a new laboratory of the Continental Carbon Co. (Witco is the sole distributor of its products) will enable the company to increase its work on the improvement of carbon black products and processes.

•

Army QM: The army has accepted title to the land in Natick (Mass.) from the state. The land will be used as part of the proposed $11 million Quartermaster research and development lab *(CW, March 17)*. The proposed laboratory will bring together all QM research activities with the exception of those relating to food and containers.

Second Round Snag

Government plans for a second round expansion of aluminum capacity may have hit a temporary snag. Reason: The Justice Department's Anti-Trust Division is taking a dim view of further increases by the present producers—Alcoa, Reynolds and Kaiser.

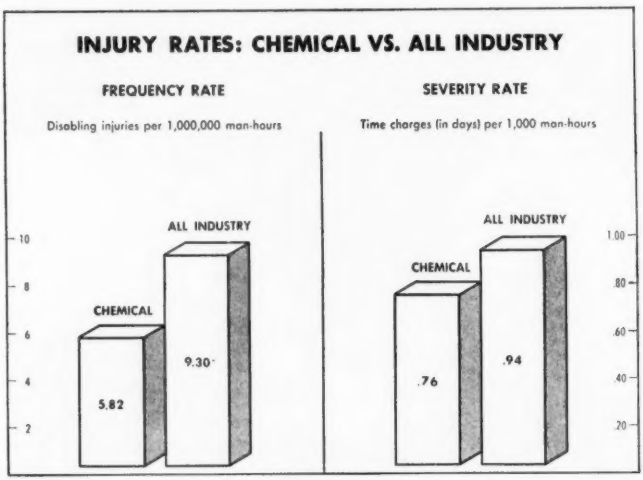
The difficulty is that the government can't find anyone else who is willing and able to turn out primary aluminum. First round expansion called for 54,000 tons from Apex Smelting Co. and 72,000 from Harvey Machine Co.

Last spring, Apex decided that it could not produce the material at the competitive price of 18¢/lb., in spite of attractive government incentives.

Harvey is still anxious to try its hand at aluminum production, but cannot raise the necessary capital.

Justice Department's attitude is an echo of the one expressed by the Celler committee. It reported that the whole aluminum program needed cleaning up, warned the mobilization heads to come up with new producers.

Meanwhile, the Big Three wonder how the country is going to get the badly needed extra capacity. They are ready, willing and able to deliver it.



Safe but Not Safest

How does the chemical industry stack up against other industries, safetywise? An answer can be gleaned from the results of two recent surveys, one by the Manufacturing Chemists' Association, the other by the National Safety Council.

Every year both groups gather data from member companies on the frequency and severity of industrial accidents. This year's MCA survey shows that members hit an all-time low on frequency rates with 4.56 disabling injuries per million man-hours worked.

But the severity rate showed an increase over the previous year. In 1949, members lost 0.65 days per 1,000 man-hours worked (including time charges for deaths and permanent injuries); in 1950, 0.73.

MCA represents 90% of all the chemical production in the country and 90% of its membership reports on safety. It should therefore present the safety picture for a large portion of the chemical industry.

Council for Comparison: For industry comparison purposes, however, the one by the National Safety Council is better suited; it lists the safety records of 40 separate industries.

For 1950, the average frequency rate for all industry was 9.3, severity, 0.94. The chemical industry ranked ninth on frequency (5.82) and eighteenth on severity (0.76).

Why Safe: A good safety record is more than good public relations; it is sound business. Insurance rates are based on past performances (compensation received over a five-year period). Some of the larger companies have a "retrospective" method of premium payment. Under this plan, the company gets a rebate if the compensation paid out by the insurance company is less than a given amount.

And aside from other considerations, industry has a responsibility to protect its heavy investment in plant and equipment. Especially in the chemical industry, with its relatively high proportion of flammables and explosives, this entails a careful watch over workers' safety habits.

It is not surprising then that the chemical industry has compiled a good safety record. MCA shows that its members have reduced the frequency of accidents by about 40% since 1946.

But it has been hard pressed to keep pace with all industry which has reduced its rate by 35% over the same period. Furthermore, the average severity rate has shown a definite downward trend while the one for the chemical industry has not.

On the whole, though, the chemical industry as done a fine job in reducing accidents. Its average has been consistently lower than the average for all industry. The MCA has been responsible for a good deal of the progress that has been made.

However, the industry still ranks ninth on frequency, eighteenth on severity. There is plenty of room for improvement.

WORLD'S FIRST COMPLETELY LITHOGRAPHED AND INNER ROLLER-COATED 55-GALLON STEEL DRUM

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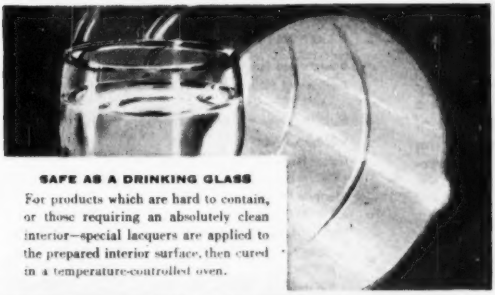
Consider the merchandising opportunities this remarkable new package presents! The durable and lustrous finish of Rheemcote drums, lithographed with *your* distinctive colors, trademarks and designs, will billboard your product and name before the eyes of the world.



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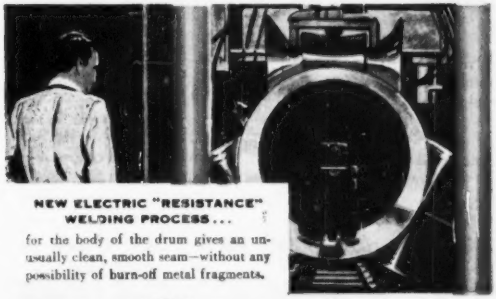
For products which are hard to contain, or those requiring an absolutely clean interior—special lacquers are applied to the prepared interior surface, then cured in a temperature-controlled oven.

ROLLER-COATING OPERATION...

applies the base coat to the steel surface, assuring positive adhesion for utmost resistance against weather and handling.



NEW ELECTRIC "RESISTANCE" WELDING PROCESS...

for the body of the drum gives an unusually clean, smooth seam—without any possibility of burn-off metal fragments.

After many years of research, the Rheem Manufacturing Company, world's largest maker of steel shipping containers, is proud to have developed the Rheemcote Process in this, its 25th year of service to industry.

For a *free*, descriptive, beautifully illustrated brochure on this important contribution to marketing — write or wire Rheem today.

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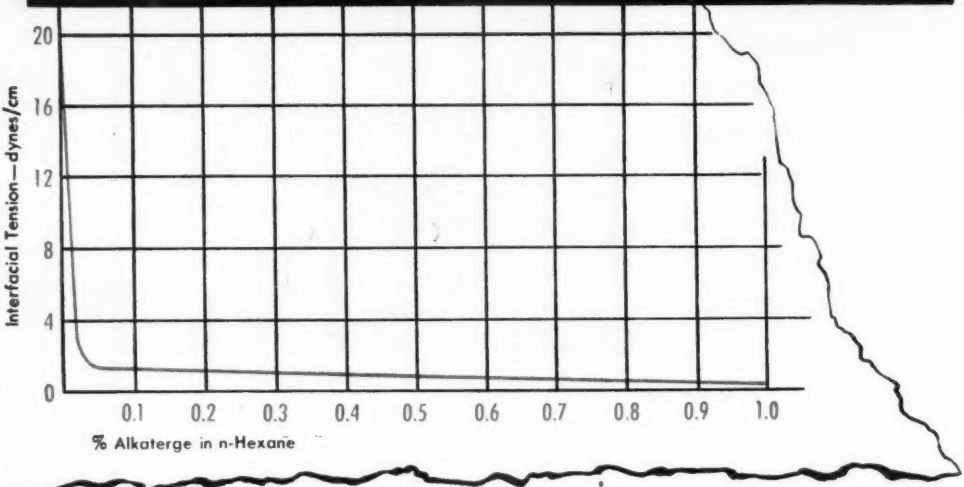
ALKATERGE-C

oil-soluble wetting agent



Just 1/25 of 1% of Alkaterge-C—that's all it takes to reduce the interfacial tension between n-hexane and water to one dyne per centimeter. In mineral oil, 0.1% reduces the interfacial tension to approximately one to two dynes per centimeter. That's why Alkaterge-C is such a successful oil-soluble wetting and auxiliary emulsifying agent. It's a sort of chemical lever—makes it easy for the emulsifying agent to do its job. This striking effect on interfacial tension suggests many applications in connection with lubrication, extraction, and impregnating operations.

This non-volatile, amine-type compound reacts with acids to form salts and soaps which are themselves emulsifying and wetting agents. Salts of the mineral and lower aliphatic acids are water-soluble. With the higher fatty acids, Alkaterge-C forms oil-soluble soaps. These salts and soaps have been used as wetting agents and penetrants in metal cleaners and in the processing and impregnating of textile and paper products.

Alkaterge-C also has many uses based on its acid-accepting and surface-active properties. It is an effective anti-foam agent, especially when used in conjunction with mineral oil, and it is also an excellent pigment-grinding assistant in mineral oil vehicles.

We will gladly furnish you with a sample and additional data upon request on your company letterhead.

PROPERTIES (of commercial-grade material)

Molecular and Equivalent Weights	350, approx.
Coefficient of Cubical Expansion (20° to 30°C)	0.0008 per 1°C 0.0004 per 1°F
Distillation Range at 3 mm of Mercury	194°C to 310°C
Solidification Point	—36°C, approx.
Surface Tension of Saturated Aqueous Solution:	Less than 40 dynes/cm
Interfacial Tension against Water of a 0.1% Solution in Mineral Oil	1 to 2 dynes cm
Flash Point, Cleveland Open Cup	430°F
Solubility	
in Water	Less than 0.002% by weight
in Mineral and Vegetable Oils	Miscible
in Organic Solvents	Miscible with naphtha, benzene, kerosene, carbon tetrachloride, ethyl acetate, acetone, methanol, butanol, and most other organic solvents.

SPECIFICATIONS (tentative)

Oxazoline Content	70% by weight, minimum
Specific Gravity, 25°/25°C	0.925—0.931
Nitrogen (Kjeldahl)	3.80—4.10% by weight
Color, Gardner Scale	15 maximum
Appearance	Clear, free from suspended matter

INDUSTRIAL CHEMICAL DIVISION

COMMERCIAL SOLVENTS CORPORATION • 17 EAST 42nd STREET, NEW YORK 17, N. Y.

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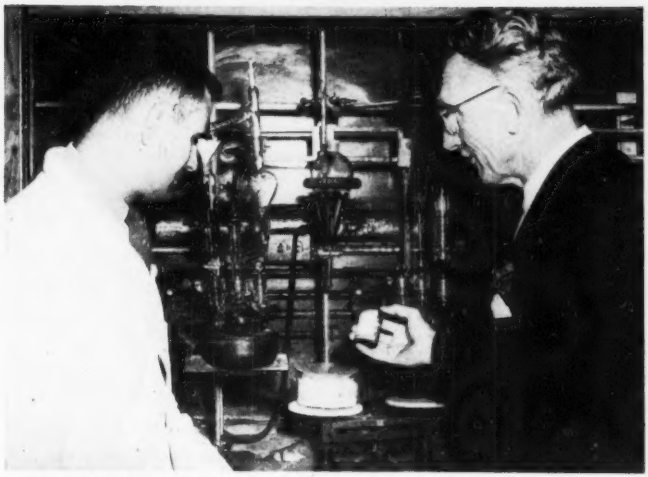


ALEXANDER SURREY (left): His Aralen synthesis sparked the quinoline search.

Double Drug Debut

Two new antimalarials are now being evaluated. One is a quinoline derivative, similar to several known drugs; the other stems from the newly discovered potency of certain pyrimidines.

Early clinical reports are encouraging, but mum's the word on future results; a good deal of current work is classified.

Antimalarial research, spurred by the threat of a new global conflict, is once more in the chemical limelight. Results are encouraging. So much so, the Army—largest antimalarial consumer—has thrown the security wraps around a good deal of current investigations.

Newest star on the antimalarial horizon is Primaquine—a synthetic developed by Robert C. Elderfield of Columbia University and Alving and Schwartz of Cincinnati U. In its first clinical tests on humans at the Illinois Statesville Prison, Primaquine was successful in 32 of 33 experimental cases. Results of additional tests in malaria-ridden Nicaragua have been kept secret, but it now appears that the drug is effective against some of the stubbornest disease-causing parasites.

Although it can cause a slight nausea, Primaquine is relatively nontoxic at recommended dosage levels. It seems to have little effect on the blood stages of the disease, being primarily active when the parasite is in the tissue. Primaquine is claimed to be 4 times as effective as existing drugs. But it is by no means a one shot cure; therapy involves a 2-week course of administration with quinine as a synergist.

The first really successful synthetic antimalarial was Atabrine,* a substituted acridine. Superior to quinine (a quinoline derivative) Atabrine nevertheless has many drawbacks; discoloration of the skin is perhaps the most noteworthy. When Atabrine's deficiencies came to light, the search for new drugs accelerated.

Although the correlation between chemical structure and physiological activity is a tricky business, certain similarities between Atabrine and quinine were apparent. Both contain a quinoline skeleton; in atabrine the quinoline structure is fused to another aromatic ring to form acridine. Quinolines were hit upon as the most fertile field for further investigation.

The Germans came up with the first synthetic quinoline antimalarial containing a methoxy group and a terminal tertiary amine on a side chain attached to the fused benzene ring. This compound, known as Plasmoquin, never came into favor because of dangerously high toxicity. Chloroquin, another quinoline-type compound developed but neglected by the Germans, was destined for bigger things.

Winthrop-Stearns took a good look at chloroquin and decided it had been grossly undervalued. After an intensive study of the material and the development of a commercial synthesis by W-S's Alexander Surrey, it made the commercial market in 1947 tagged Aralen. In effect, Aralen* is two-thirds of the Atabrine molecule. The chlorine and nitrogen are in different relative positions but the side chain, 1-methyl-4-diethylaminobutyl, is identical in Aralen, Atabrine, and Plasmoquin. Marketed as the diphosphate, Aralen has all but replaced Atabrine in this country.

Primaquine, newest of the quinoline antimalarials, is identical with the earlier Plasmoquin except for the startling presence of a terminal primary amine group on the side chain. Previously it was assumed that the tertiary amine was least toxic; primaries never even were considered.

Report of another promising new drug, by Wellcome Research Laboratories, has opened another avenue of attack. Neither a quinoline nor an acridine, the neophyte† is a member of the pyrimidine series.

Discovery of the antimalarial activity of 2,4-diaminopyrimidines occurred while the Wellcome team, under the direction of Dr. George H. Hitchings, was probing nucleic acids. Antimalarial possibilities were noted when a substance with the potency of quinine was discovered. Since then progressively stronger substances have been developed culminating in the new drug, which has a claimed potency 1,000 times that of quinine.

When this potency was realized, the Wellcome team worked out an improved synthesis of diaminopyrimidines by condensation of α-aryl-β-alkoxyacrylonitriles with guanadine.

Still in the experimental stage the drug's true value is not yet known. At present it is being tested in Africa. If proven successful, the new drug could be a stiff competitor for Winthrop-Stearns' present quinoline antimalarials. Its tremendous potency is such that a single ounce would constitute a five-to-ten year supply, and cost of treatment would be extremely low. Readily synthesized from simple or-

* 2-chloro-6-methoxy-9(1-methyl-4-diethylaminobutyl)amino acridine.

*7-chloro-4-(1-methyl-4-diethylaminobutyl)amino quinoline.

† 5-p-chlorophenyl-2,4-diamino-o-ethyl pyrimidine.

ganic chemicals, the drug could easily swing into major production.

At present the great bulk of the antimalarial market is controlled by Winthrop-Stearns with Atabrine and Aralen. The company holds patents on both drugs, but so great was the need for atabrine during World War II that other manufacturers were licensed to produce the material.

With 500,000,000 malaria sufferers and 3,000,000 deaths each year, any new hope for a cure or superior suppressive is welcome. It is estimated that the productivity of many areas could be raised 100% if malaria were conquered. Such a possibility keeps the search for antimalarials at a high pitch.

Hot Tires Save Miles

Researchers at the B. F. Goodrich Research Center, Brecksville, O., have devised a time-saving method of testing tire wear. The new technique eliminates the need for conventional 5,000-mile road runs, enables rapid evaluation of factors like type of road surface, temperature, speed, and tire pressure.

Radioactive phosphorus is the key to the new time- and money-saving technique. Under the direction of William L. Davidson—chief of physical research—Goodrich workers have succeeded in their efforts to incorporate isotopic phosphorus into a special tire tread material.

The hot tires are mounted on motor vehicles and put through a number of performance tests. Wear data is obtained by measuring the radioactivity in the tire track left on the road. For added insurance, a vacuum scoop is mounted behind the tire and just above the road to catch rubber particles blown into the air.

Radioactivity of the tire track and vacuum collector is measured with a Geiger counter. For greater accuracy, X-ray photographs are made of the hot tire tracks; as little as 0.05 of a microgram of rubber can be detected by this method. In addition to confirming the amount of worn rubber, the X-ray studies also provide an estimate of the size of rubber particles left on the road.

For practical reasons, there are no completely satisfactory laboratory tests for determining tire tread wear. Prior to the new Goodrich development, a 5,000-mile road test was considered a bare minimum for significant results. Such tests—usually made with fleets of cars and trucks—are expensive and time-consuming. Now the same performance information, readily and cheaply obtainable, should prove an invaluable ally in getting more miles out of new treads.

WILLIAM L. DAVIDSON: Isotopes make a hit on the road.

Double Duty: Tennessee Eastman Co.'s new blue dye for cellulose acetate fibers is reported to be equally effective with Dacron polyester fiber. Designated Eastman Fast Blue GLF Concentrated, the dye boasts excellent light and gas fastness. According to the manufacturer, it is the only blue dye now available which possesses such fastness on Dacron.

•

Pyridine Split: Differentiating nicotinic acid from nicotinamide is simplified by a new procedure out of the Food and Drug Administration. The mixture is treated with cyanogen bromide to split the pyridine rings; reaction products are coupled with sulfanilic acid and analyzed in a spectrophotometer.

At 430 millimicrons, the absorption of the nicotinic acid-derived complex is about twice that of the nicotinamide product. The latter is quantitatively hydrolyzed to nicotinic acid. Percentage composition of the mixture is determined from absorption measurements before and after hydrolysis.

Procedure should be of value in commercial vitamin assay.

•

FAD's Here: Sigma Chemical Co., Saint Louis, Mo., reports the first commercial availability of flavin adenine dinucleotide (FAD). The rare biochemical is extremely difficult and costly to prepare. Manufacturer will set price after consulting potential customers.

New Sulfone: Merrimac Division of Monsanto Chemical Co. is now offering research quantities of diamino diphenyl sulfone. A free flowing, light brown powder, the chemical can be used in the synthesis of azo dyes. Possibilities: Base for ion-exchange resins; organic intermediate.

•

Inhibitor: B. F. Goodrich Co. researchers report that polymerization of 1,1-dicyanoethylene, due to atmospheric exposure, may be inhibited by treatment with gaseous sulfur dioxide.

•

Cold Cure: A new furane resin polymer, developed by Furane Plastics, Inc., may be applied and cured at room temperature by brush, dip, or spray techniques. Trade-named Resistojet, the resin is intended for use as a chemically resistive coating. Good heat resistance is a strong feature.

•

Quartz Check: U. S. Public Health Service researchers have come up with a method of determining quartz in the presence of silicates. Mixture is heated with 85% phosphoric acid. The pyrophosphoric acid formed dissolves silicates, but not quartz. Procedure should be valuable for determining silicon dioxide in dust as an estimate of silicosis hazards.

•

Pain Killers: According to Sterling-Winthrop researchers, 4-thiazolidone derivatives possess local anesthetic activity. Several compounds in the 3,4-methylenedioxy group were more active than procaine.

•

Sesame Story: Just off the press are a series of 10 technical articles summarizing processing and utilization research on sesame oil. The work, carried on at the USDA's Southern Regional Research Laboratory is reputed to be the first systematic investigation of the oil to be recorded. Reprints are available.

•

Cosmetic Aid: As a result of research patented (U.S. 2,551,627) by Norwegian chemists, solutions of polythionates and polythionic acids may now be employed in cosmetics and dermatological preparations. Decomposition previously was the chief obstacle. Problem was overcome by using redox-regulating catalysts like cupric and ferric ion.

•

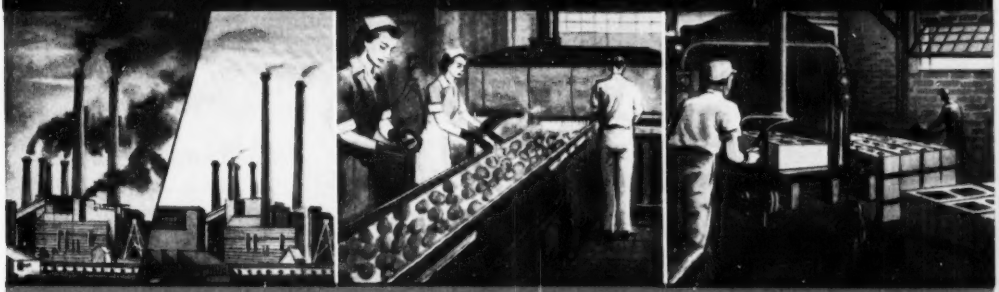
Fiber Research: The wheels will soon be turning on three new USDA research projects aimed at improving cotton utilization. Development of more effective dry cleaning method is one major objective.

ORONITE CHEMICAL COMPANY

THE NAME TO WATCH IN CHEMICALS

D-40
is more than a detergent

The detergent base of many industrial and household cleaning compounds, Oronite D-40 has dozens of other uses. Its versatility and high quality are characteristic of the chemicals made by Oronite—a dependable source of basic ingredients for better products.



THREE TYPICAL INDUSTRIAL USES OF ORONITE D-40:

1 SMOG REDUCTION

Use of D-40 in smog control systems, removes hydrocarbons from stack gasses and prevents the formation of undesirable emulsions in the "scrubbing" solution. In actual practice this process has reduced exhaust smoke by as much as 90%, which offers a potential control of smog conditions in industrial areas.

2 AGRICULTURE

In addition to its value in washing many fruits and vegetables, Oronite D-40 is a tremendous aid in peeling these foods during canning and packing operations. Two distinct advantages are obtained; 1) immersion time and the concentration of alkali can be reduced and 2) the fruits and vegetables retain better color.

3 CEMENT

The use of Oronite D-40 in the production of cement products, such as building blocks, provides many distinct advantages. The texture of the finished product is improved, water requirements reduced, plasticity and workability are better and "stripping" from molds or forms is facilitated. In addition, the abrasive wear on mixing equipment is greatly reduced. All these contributions help cut production costs.

A partial list of other Oronite Chemicals

NOTICE
Some of the following are currently in short supply.

Detergent Alkane	Gas Odorants	Ortho Xylene
Detergent Slurry	Polybutenes	Para Xylene
Detergent D-60	Sodium Sulfonates	Xylol
Wetting Agents	Purified Sulfonate	Aliphatic Acid
Lubricating Oil Additives	Naphthenic Acids	Hydroformer Catalyst
Cresylic Acids	Phthalic Anhydride	

If you want more detailed information about D-40 or other Oronite Surface Active Agents, just write us and we'll be glad to send it to you.

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This great progress in chemistry has been accomplished within the lifetime of most of us. The American Chemical Society—now celebrating its 75th Anniversary—has in that time grown from a handful of pioneering scientists to a membership of over 60,000.

The people of Union Carbide congratulate the members of the American Chemical Society on their Diamond Jubilee. The Society's history has been a record of continuing progress in chemistry and engineering and has kept pace with the constantly increasing needs of science and industry.

Producers of alcohols; glycols; ethers and oxides; glycol-ethers; esters; plasticizers; ketones; aldehydes; organic acids; anhydrides; wetting agents; nitrogen, chlorine, and sulfur compounds; and synthetic textile fibers.

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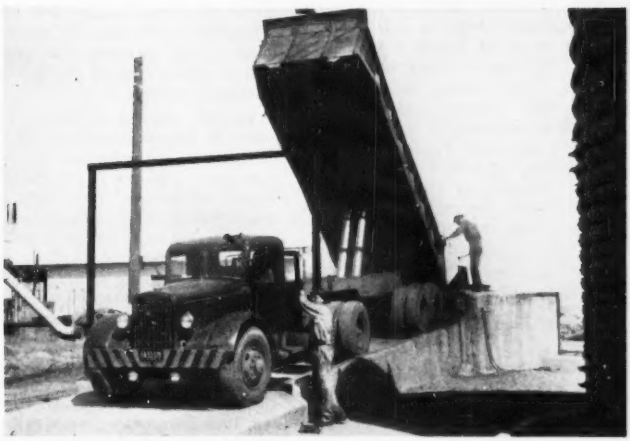
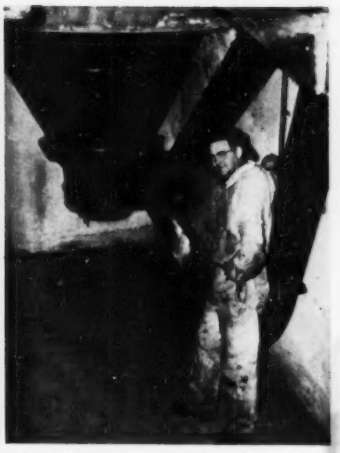


1 OXIDE sinter from roasting iron pyrites comes to ferric chloride plant in 20-ton trucks. Eight tons are consumed in a normal operating day.



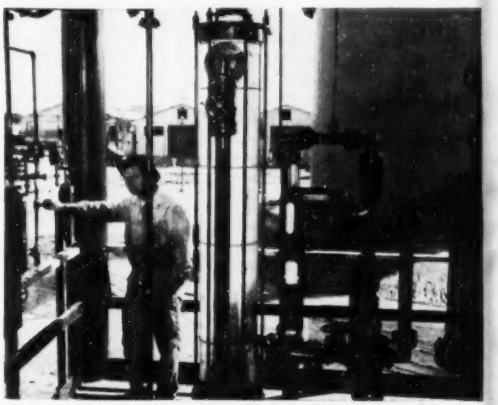
2 CINDER first moves from basement to ground level reactors.

One Man Plant

One of science fiction's pet dreams, push-button production, is nearing reality at Dow's Pittsburg, Calif., ferric chloride installation. A model of smooth chemical manufacturing, the entire plant is run by one man. Modernization came to the unique operation when it was recently moved into a new plant with the latest in equipment.

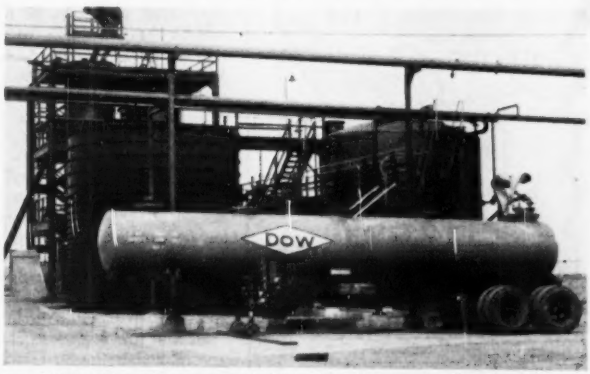
The operation practically runs itself. In the compact processing unit the roasted iron pyrites moves from the basement hopper to the ground level muriatic acid reactors. From the reactors the mixture flows to the second floor chlorinator, passes through the cooler, and then into check tanks. The only time the lone operator touches his product is when he tests it for purity before it goes to storage tanks.

Corrosion is a major factor in ferric chloride production. To minimize damage all tanks are rubber lined, pipes are Saran lined, and the plant is painted with acid-resistant paint.



3 AFTER two-step reaction with muriatic acid, mix goes to porcelain chlorinator on the second level.

4 SAMPLES of finished liquid are titrated to test quality of the chloride.



5 TRAILER trucks carry much of the chloride from the plant, loading 3,450 gals. in about 45 minutes. Tank cars transport the remainder.

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You can depend on SOLKA-FLOC for unexcelled uniformity—because of Brown Company's own control of raw materials for conversion to flock, its large, steady volume of manufacture, and its many years of production experience in purified cellulose of every form.

Each SOLKA-FLOC item is manufactured to a controlled bulk level, the apparent densities varying from 9 to 34 pounds per cu. ft. It ranks high as a *filter aid, as an inert carrier for odors or for purification by adsorption.*

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In a Package

A packaged dryer is now available from Patterson Foundry & Machine Co. The unit consists of a rotary dryer, screw feeder, air heater, fan and dust collector mounted on a single steel frame.

For optimum drying under the many varying conditions that actually exist the unit is equipped with a drive which can vary the feed rate over a range of 3 to 1.

Heat is provided by combustion of oil or gas and the products of combustion pass in direct contact with the material being dried. Units in diameters of 2′, 2′ 6″, and 3′ with lengths of 10′ to 24′ are available. Both plain and stainless steel models can be supplied with white acid- and abrasion-resistant Porox linings.

"Lab" Dishwasher

Cleaning laboratory glassware is a most costly item in many laboratory budgets. To reduce this cost and to speed up the cleaning operation, Fisher Scientific Co. has developed a new washer which will clean up to six baskets of glassware at once.

Wire baskets of the proper size are loaded and attached to horizontally mounted drum which is rotated at 9 rpm to move the glassware in and out of the cleansing solution. Hot and cold water jets provide rinse water for removal of the cleaning solution from the glassware. And steam connection can provide sterilization as a final step if this should be desirable.

Oxygen Web

Gaseous oxygen will soon move to many of the Houston Oxygen Co.'s customers via an elaborate underground pipeline network of 3″ steel pipe. First customers to be affected will be those within a 10 to 12 mile radius of the company's new plant. Biggest and most immediate advantage of the new method of delivery: reduced distribution costs, saving for consumers.

The product of the new plant will be liquid oxygen which will be stored at atmospheric pressure at the plant in two 30,000 liter containers (about 900,000 cubic feet of oxygen per container). These tanks will supply the company's customers at San Antonio, Corpus Christi, Brownsville, Orange and Fort Worth via tank truck.

At 200 psi: A portion of the liquid oxygen will be gasified and stored at 2000 psi for the pipeline customers. But before entering the pipelines, the pressure will be dropped to 200 psi. Metering of the oxygen will be accomplished as it enters the customer's plant. After metering the pressure can be adjusted to suit the individual consumers needs.

Pipeline delivery of oxygen eliminates the headache of handling cumbersome oxygen cylinders for nearby customers. And the transportation of liquid oxygen in 5,000 liter tank trucks will accomplish the same thing as far as the more distant larger customers are concerned. In these trucks stainless steel lining resists the affects of low temperature and heavy insulation cuts down the loss of oxygen (and dollars) by evaporation.

Figures Prove: A few figures prove the advantage of truck oxygen over the conventional tank delivered product. In high pressure oxygen cylinders the ratio of cylinder weight to oxygen weight is 6.5 to 1. When shipped as a liquid the ratio is 1 to 4. Quite a reversal!

Even small customers using the tank oxygen will benefit from the overall improvement in means of delivering oxygen. The company plan to set up additional storage capacity over its marketing area from which several customers can be served by the contents of one truck. Cylinders will be filled and distributed from these halfway houses . . . much in the fashion that lemonade is dispensed to thirsty wayfarers.

•

Control and Safety Shutoff: Operation of Burling Instrument Co.'s temperature control and cutoff has been made safer by substitution of pneumatic for electrical switching. The instrument's operation depends on the movement produced by thermal expansion of a metal tube. This motion operates a lever which transmits the motion to a pilot air valve. Action of the pilot valve activates the diaphragm control valve which cuts off the system.

•

Sulfur Dioxide Recorder: The Thomas Autometer, produced by Leeds and Northrup Co., is now available in an integrating assembly. It not only records the immediate concentration of sulfur dioxide in the air, for pollution control, but records the average concentration integrated over the previous half hour. Concentration range: 0 to 5 ppm of sulfur dioxide.

•

Ammonia Canister: Mine Safety Appliances Co. has developed a new ammonia canister which increases the service life of the mask nearly 100%.

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FOR COMPLETE LIST of Hooker Chemicals, send for Bulletin 100, which describes properties, typical uses, and shipping containers. Please write on your business letterhead.

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POLYETHYLENE BOTTLES: They'll vie for flake with other defense uses.

Competition for Glass

Plax Corp. is now blow-molding one- and two-gal. polyethylene bottles, Mills has similar one-gal. bottle.

Tough, resistant, they afford possibilities for sizable reduction of shipping costs.

Pinch for polyethylene flake means that a supply will be available for shipping defense products; other users must wait.

Chemical packagers have long had envious eyes on the container possibilities of tough, resistant polyethylene. Principal drawback to its use as a bulk carrier for chemicals has been that one-piece bottles were too small, while welded ones have a tendency to come apart at the seams.

Now two companies have independently developed methods for blow-molding large, one-piece bottles. Elmer E. Mills (Chicago) has a one-gal. bottle *(CW, July 21)*, is currently distributing samples as it tools up for full production.

This week, Plax Corp. reports that it has not only a one-gal. one-piece bottle but a two-gal. companion for it. Both sizes are in production for use of defense and defense-supporting industries.

No Breakage: Full reports on the performance of the blown bottles are not in, but it's a safe bet they will pass the Army Ordnance's most rigorous tests. Tests that have been completed indicate they will stand up under extreme changes in temperature, are not cracked by ice, and will not break if dropped 45 ft. onto concrete.

Being virtually indestructible, they should afford sizable savings by reducing breakage. And being chemically inert, they are prime candidates for hydrofluoric acid, hydrogen peroxide, sulfuric acid and other hard-to-handle chemicals.

Costs Cut: Since the price will vary with the quantity ordered, it is impossible to put a price tag on the new containers. One certainty: The high cost of polyethylene compared to glass ($980/ton to $8/ton) will make them a good deal more expensive than glass bottles.

The high tonnage cost of polyethylene is partially offset by its lower bulk density—weight of the new containers is roughly one-third their glass counterparts. This in turn means sizable savings in shipping costs.

Even bigger savings on shipping will accrue from the fact that the containers are not breakable, thus eliminating the need for packing materials.

An indication of the saving can be obtained from recent tests made by Plax in conjunction with a government agency: Sulfuric acid requirements for three different types of batteries were packed for shipment according to present Army specifications. One set was packaged in the polyethylene bottles, another in glass. Weight savings with polyethylene ranged from 19.1 to 48.2 lbs., space savings from 930 to 1900 cu. in.

The Catch: The fly in the ointment, of course, is the tight supply situation on polyethylene. Since June, the material has been under allocation (NPA Order M-45, Schedule 5).

NPA follows the government policy on not releasing production statistics where there are only two producers—in this case Du Pont and Bakelite. The agency does, however, say that production (CW estimate: 55 million lbs. a year) is running well behind demands.

New capacity should help the situation. NPA estimated last spring that production this year would be up 40% over 1950, and up 140% by the end of next. Bakelite's new unit (between 15 and 20 million lbs.), due in next month, should provide some immediate relief.

The trouble is that demands seem to go up with every increase in production. Although a complete breakdown is not available for August, NPA told CHEMICAL WEEK that military DO's will take 55% of the available supply of flake. In the coming months, says NPA, the figure will grow even higher.

The new containers then will have to vie with other high-priority uses (film, drum liners) for raw materials. The best estimate at this point is that a supply of the new bottles will be available for defense products. Nonessential users will eventually get a share also, but it looks like they are in for a long wait. NPA and industry agree that the material will be critical at least until the end of 1952.

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CAR LACQUERS: More like them hot.

Lacquers: Hot-Spray Climb

Hot-spray lacquers, two years ago less than 1% of the lacquer business, now represent 5-10% of lacquer volume. Higher application temperatures permit formulations with higher solids, less solvent; give better flow, less "orange peel".

Although much current high popularity is attributable to present solvent and alkyd resin raw material shortages, other advantages—savings in labor, materials, equipment and time—are winning permanent converts.

The Military is the latest to give its approval to hot-spray lacquers, having recently issued a specification (MIL-L-11195) covering a lacquer that imparts a lustreless finish to ammunition. This is an alternate for a styrenated alkyd specification, and as such, points up one of the reasons for the boom in hot-spray: conservation of short materials such as castor oil and phthalic anhydride.

Although Hercules Powder Co., which has been the most active in promoting the new lacquers (as an additional market for its nitrocellulose), has not been backward in stressing the ready availability of the basic raw material—nitrocellulose—and its adaptability to a number of formulations, there are other good reasons for the rapid growth of these finishes. And when present shortages of solvents and raw materials for other types of finishes are no longer a problem, most of the hot-spray converts will probably stay in the fold for these reasons.

Actually the composition of hot-spray lacquers for any application can be the same as that of cold spray lacquers with the exception of the solvent blend. Heat instead of thinner is used to reduce the viscosity of the lacquer, so the formulation requires less solvent. The lacquer manufacturer also eliminates the more volatile solvents from his blend, since the material is usually sprayed at about 160 F.

Time and Money: The higher solids at which application is made removes one of the basic drawbacks to lacquers by permitting thicker, and hence fewer coatings. Previously solids above 20% could not be achieved since the viscosity became too high for spraying, so many thin coats had to be applied to a surface. Fewer applications mean a solid saving in labor expense, and an increase in the capacity of the finishing shop.

Loss of solvent (a big item in plants with no recovery facilities) is lower, for less solvent is used. For example, it requires 3.76 pounds of solvent to apply one pound of solids from a typical formula at 21% solids, but only 2.33 pounds of solvent when a 30% solids hot-spray formulation is used.

Hot-spray lacquers cost more per gallon since they have more of the expensive components—resins, pigments, nitrocellulose, plasticizers—but the coverage is better. One lacquer manufacturer, for example, has calculated that the material cost in refinishing a car with a hot-spray product is 40% less than with a cold spray lacquer. His analysis also shows that while the raw material cost of a conventional lacquer for such a job is over twice that of a synthetic enamel, material cost of hot lacquer is only about one-third more. Thus the new application technique puts lacquers in a better competitive position with synthetic enamels which have moved in on them in the automobile field, prior to the 'thirties practically exclusively in the lacquer camp.

In addition to these cost savings, the newer lacquers flow out better than those of thinner solids, have less tendency to form an "orange peel" surface, and therefore require less rubbing; and "blushing" (caused by moisture condensation of fresh lacquer as it is cooled by solvent evaporation) is eliminated.

Equipment Hurdle: Actually the process is not really new, for Commercial Solvents developed it a number of years ago, and it has been popular in Europe, particularly Sweden. When Commercial Solvents released its patents several years ago (manufacturers making hot-spray lacquers previously had to register their formulas with the company, and that gave it leads on sales prospects for certain types of solvents), Hercules made a survey of the field, decided that here was another way to push nitrocellulose. But equipment to apply the lacquers at their best advantage was not available.

Hercules first tried missionary work among equipment manufacturers to improve the heaters then on the market. This didn't work, so it took the story of hot-spray lacquers to lacquer users in such fields as the furniture industry, metal finishing, and automobile refinishing. Indirect pressure from them spurred heater manufacturers, and now eight companies are making efficient heating units.

With such equipment available, sales of such lacquers have boomed over the past two years. Perhaps the

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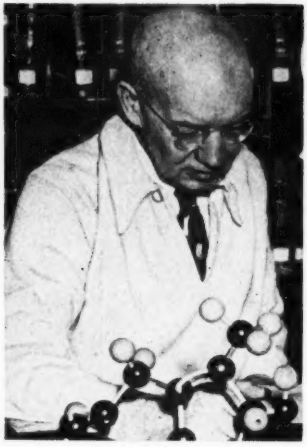
greatest impact has been made in the furniture—including radio and television sets—industry where lacquers hold over three-fourths of the market for finishes. They have also made great headway in the auto refinishing field, which places high value on a quality finish that can be applied rapidly and with simple equipment.

At least one aircraft company—Douglas at its El Segundo, Cal. plant—is using hot-spray lacquers to finish many metal parts, including aluminum, reports a 50% saving in finishing time. Automobile manufacturers (about half of the new cars produced are finished with lacquers; half with synthetics—principally alkyd types) are also experimenting with the new method, and one Kaiser-Frazer plant has adopted it.



USDA'S La FORGE: His allethrin a million dollar baby now.

Sprouting Allethrin

More allethrin, the synthetic substitute for natural pyrethrum, is on the way. Carbide has just been granted a certificate of necessity for a $5.9 million plant, and U.S.I. is busy building a $840,000 unit. Benzol Products, the third producer, hopes to have its expanded plant in operation by the end of the year.

Carbide and Carbon chemicals has not yet said it will go ahead on the proposed half million pounds-per-year Institute, W. Va., installation. The betting among insecticide manufacturers, however, is that it will.

Allethrin received a tremendous boost when the Army specified it in place of pyrethrins in aerosol insecticidal formulations (*CIW, Jan. 27*) and, while lacking some of the properties of the natural material, there seems seems to be no doubt that its place as a basic insecticide is assured. Carbide, which achieved commercial production about a year after a U. S. Department of Agriculture team headed by F. B. La Forge reported its synthesis of the pyrethrum-like chemical, has probably turned out more of the material than anyone else, would be the biggest factor in the business if it puts in the new plant.

The capacity of the plant that U. S. Industrial Chemicals listed in its application for a certificate of necessity—like Carbide, it has been granted a 50% rapid tax write-off by DPA—was a "little more" than 36,500 pounds per year. This unit is being built on its Baltimore property, should be in operation within a year.

Quiet and Private: Benzol Products has been turning out the material at Piscataway, N. J. for about as long as Carbide. Already making some of the intermediates when the USDA put the discovery in the public domain, it tackled the difficult 12-step synthesis, soon was producing on a "tonnage basis."

Not so much has been heard of Benzol's role in allethrin, nor is as much known about its capacity as about Carbide's and U.S.I.'s future output for (1) It makes the material exclusively for McLaughlin Gormley King, long an important factor in the pyrethrum business; and (2) It has received no accelerated tax write-off. (Carbide's material is distributed by McLaughlin Gormley King, and two other pyrethrum oldtimers, John Powell and S. B. Penick.)

Benzol's annual output probably won't be anything like a half million pounds, but it will be sizeable. Its present unit that has been running successfully, is being stepped up considerably, and by the end of the year, a larger plant is expected to be in full operation.

Good News: Insecticide formulators will welcome as much allethrin as is forthcoming. Pyrethrum flowers, most of which are imported from South Africa, are prized for their quick knockdown in insecticides, and their non-toxicity. Imports have been declining steadily, yet the demand for pyrethrum in dairy insecticides has been increasing since DDT has been banned in livestock sprays. Manufacturers have been unable to substitute allethrin as enough has not been available, and what has been produced has gone principally into military insecticides.

In addition to relief from this supply condition, there is prospect of

freedom from dependence on imports of the vital insecticide—important to the military, and a basic reason for their interest in allethrin. The price of the synthetic has to be lower than pyrethrum to compete with it, and not only will it be lower, but since it won't be governed by growing conditions and foreign controls, it will not fluctuate as pyrethrum has in the past. None of this will make formulators unhappy.

Baker's Brown

London Chemical Co. (Chicago) has just moved to larger quarters. A primary reason for the move is a seventy-fold increase over last year's sales of its bakery pan cleaner which does not remove the "baker's brown" so essential to quality goods.

The tin coating on steel pans prevents rusting, but the highly reflective surface also does a poor job of baking. Consequently pan manufacturers or bakers generally develop a heat absorbent, amber-to-brown coating of tin oxides on new pans by heating at 400 F. Coating before each use would be a losing proposition, so bakers insist that cleaning leave the pan tan.

Drives for increased sanitation in bakeries have been met with opposition by the industry because most cleaners and detergents are alkalis. Their etching action on tin pans removes the desirable coloration as well as unwanted carbonaceous materials, etc. With the shortcoming of current products in mind, London started working on the problem and finally came up with a complex mixture called "Pan-Tan".

Less Bite: Alkali appetites for tin had to be shrunken in some way without loss of cleaning speed and efficiency. Buffering with sodium dichromate to pH 8.6 was the answer. The cleaner still did the job quickly, didn't attack the oxide film, rinsed freely and had longer life. Free rinsing without brushing is due to the addition of another agent which permits an unusually high dichromate concentration without formation of insoluble dichromates.

Unfortunately while it protects the brown film from alkali etching, dichromate can be decomposed by the sugars, oils and carbonaceous materials which the alkali removes from the pan. To prevent unwanted decomposition and give the solution longer life, three different amides of high molecular weight are added; these tie up the contaminants in a colloidal dispersion.

Since cleaning operations are usually carried out at a rolling boil, a defoaming agent had to be incorporated to counteract the foaming tendency of soap formed by the oils and alkali.

The product soon found favor with bakers and from an original 500 lbs (mostly samples) in Jan 1950, sales last month had climbed to 35,000 lbs.

Glamour Plus

Latest polish—Sears, Roebuck's Silicone Furniture Cream—is the first to combine two of the biggest sales boosters in the household specialties field: silicones and an aerosol dispenser.

Like all Sears cleaning aids for the housewife, the new polish is manufactured under its Maid of Honor

FOAM POLISH: Silicones at fingertip.

label. The container holds 9½ oz. of material, retails for 98¢. It is now being nationally distributed.

In coming out with a foam-type aerosol polish, the mail order house has stolen a march on many other manufacturers who are experimenting along the same lines. Apparently Sears (or more correctly, Plaze, Inc., St. Louis, which Sears says is making the product for it) has solved the corrosion problems that have been troubling some aerosol fillers.

The polish looks just like canned "whipped cream" and is dispensed similarly. The container is turned upside down, the valve stem pressed slightly to one side, and the foam spurts out the nozzle onto the article to be cleaned and polished—furniture, Venetian blinds, woodwork, metal surfaces—or a rag. Sears' slogan is "No Mess . . . No Waste . . . No

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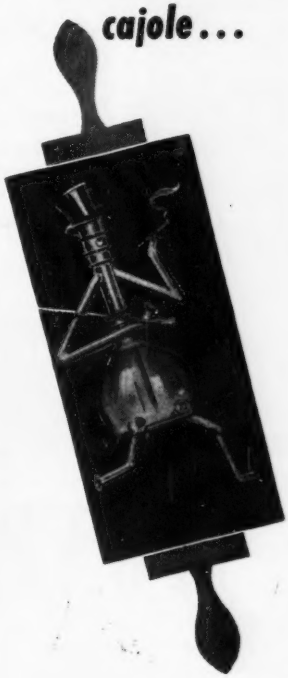

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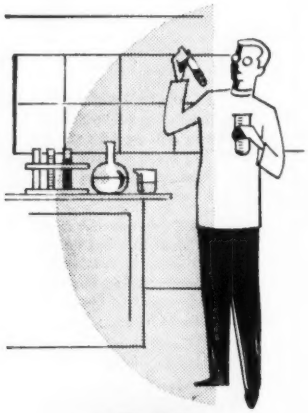

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SPECIALTIES . . . .

Work," and its directions follow that line. The foam is just smoothed out and allowed to dry; the resultant finish is said to be durable, finger print-resistant, and easy to dust.

Selling Magic: The "At last! Magic silicones come into your home" message on the container is in character with current promotion of silicones for a score of household polishing jobs. The push-button feature is an added fillip to the housewife's desire to simpllfy her work (and the foam looks a lot better than many liquid silicone polishes, some of which settle badly in their glass containers).

Like most foam aerosols, the can has to be shaken prior to use to disperse the liquefied gas—Freon or Genetron propellent—in the silicone-detergent-water formulation. As the emulsified liquid propellent-polish mixture is forced through the nozzle, the propellent vaporizes, transforming the formulation into a foam. This both cleans and leaves a protective silicone—probably 1-2% is present in the formula—coating.

2,4-D Pellets

A pelleted form of 2,4-D designed especially for application by airplane or helicopter has been developed for pre-emergence weed control in Hawaiian cane fields. Experimental quantities are being produced by American Factors, Ltd., Honolulu, sales representative of Monsanto Chemical Co. in Hawaii.

The idea of using pellets to apply the chemical weed killer without excessive drift was conceived by the Hawaiian Sugar Planters' Association and developed with Monsanto's technical assistance.

Preliminary tests indicate that safe and efficient control is obtained with approximately one pellet per square inch. The 2,4-D acid, which has been applied to porous volcanic ash particles of uniform size, is slowly leached out onto the soil by moisture to prevent the emergence of weeds. Experiments to date have been promising, according to F. E. Hance, HSPA chemist; use of the pelleted material at several sugar plantations, however, is still experimental.

•

Soap-Synthetic Detergent: A combination soap-synthetic detergent cake composed of a fatty acid soap to impart lubricating and lathering properties and an anionic sulfated or sulfonated organic synthetic detergent is described in U.S. Patent 2,508,578 (Colgate-Palmolive-Peet). The soap

precipitates insoluble soaps due to water hardness; the synthetic detergent lather promotes rinsing of these insoluble soaps and dissociated grime.

•

French Dentifrice: The first French ammoniated dentifrice has just been put on the market by the French laboratory Derol. It's a partially soluble powder, may be used as mouth wash as well as for brushing teeth. Included in the formula are urea and ammonium phosphate.

•

Nylon Duller: Richmond Oil, Soap and Chemical Co. (Philadelphia) has developed a new type non-metallic duller for nylon hosiery. The product, called Ronyl, reportedly gives the nylon a partial stiffening quality as well as the dull finish. Being non-metallic, it is easily miscible in the regular finish bath.

•

Mason Sold Again: Property of Mason Paint Co., Louisville, was sold again at a Circuit Court Commissioner's Sale, this time to seven stockholders of the company for a price of $190,000. The sale had been ordered to satisfy claims of $188,000 by its largest creditor.

William T. Mason, president of the company, bought the property from the court two months ago for $295,000 and paid in $6,500, but failed to make further payments as agreed. The stockholders buying the plant plan to continue operating it, or to lease it to a holding company.

•

Refractory Expansion: Need for dolomitic refractory materials in the steel industry will result in a $3.5 million project by Basic Refractories, Inc. at Maple Grove, near Tiffin, O., and an $850,000 expansion by the Dolite Co., Toledo, at Gibsonburg, O.

•

Vaccine Firm: Veterinary supplies will be manufactured by Murray Laboratories, a company recently formed in Springdale, Ark., by a group of poultrymen. W. L. Murray, one of the stockholders, will head the company which, in addition to manufacturing vaccines, will maintain an experimental laboratory.

•

Harris-Seybold Move: The litho chemical business of Harris-Seybold Co., Cleveland printing press manufacturer, has grown so much that the company has moved its chemical division to a separate building where 24,000 sq. ft. of floor space will be occupied in manufacturing these products. They now account for $1 million of the company's business volume.

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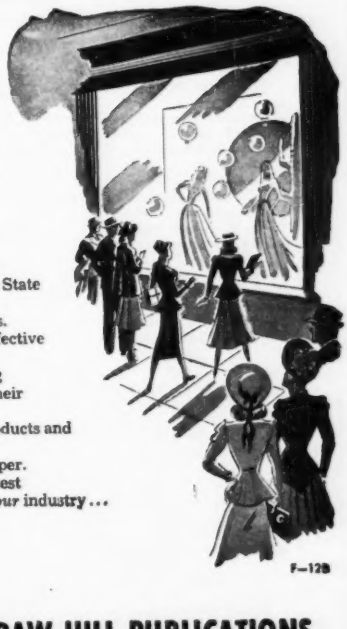

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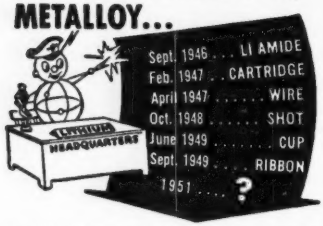
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BOOKS . . . . . .

Six Membered Heterocyclic Nitrogen Compounds With Four Condensed Rings, by C. F. H. Allen. Interscience Publishers, Inc., New York, N.Y.; 358 pp., $10.

The second in the series, "The Chemistry of Heterocyclic Compounds," this volume presents the important heterocyclic nitrogen analogs of the seven different ring systems established by fusion of four benzene rings—with the systems being discussed in sequence. In collaboration with five other authorities, the author has arranged his material in such a way as to point up similarities and differences of the various members of the systems. This group of heterocyclic compounds are of value to the drug and dye industries as well as having an important theoretical importance in organic chemistry.

Quantitative Organic Microanalysis, Fifth English Edition by Fritz Pregl and revised by Julius Grant. The Blakiston Co., Philadelphia, Pa. ix + 343 pp., $5.50.

Prepared as an up-to-date textbook, this fifth English edition retains an international character in setting forth for the reader the tested methods of leading microanalysts. Each of the various methods are presented with reference to introductory material, apparatus used, reagents, procedures and calculations. New material is included on the direct determination of oxygen, selenium and antimony and improved methods for determination of molecular weights cryoscopically, mercury, phosphorus, etc. This volume is complete with chapter references as well as the appendix of British and American Apparatus Standards.

Briefly Listed

ADVANCES IN VOLUMETRIC ANALYSIS, 200-page reference handbook by H. B. Kellog, containing compilation of selected methods of volumetric analysis along with a listing of reagents necessary for each individual analysis in accordance with the method of procedure. From Lefax Publishers, Philadelphia 7, Pa. for $2.

THE ECONOMIC PROSPECTS OF CHEMICAL INDUSTRIES IN INDIA, by A. K. Madan, deals with the growth, present position, and prospects of the chemical industry in India, reviewing the general progress of basic industries, mineral and agricultural fields and surveying the position of industries concerned with fertilizers, heavy chemicals, fine chemicals, etc. Available from Industrial Chemicals (India), Central Bank Bldg., Masjid Bunder Rd., Bombay 3. Price: $5.

ENGINEERING STANDARDS MULTIPLE V-BELT DRIVES, 16-page manual presenting engineering standards covering multiple V-Belt Drives, V-Belt sheaves, and V-belts—all used primarily for power transmissions in industrial applications, offers recommendations for attaining maximum efficiency of drive. From the Multiple V-Belt Drive & Mechanical Power Transmission Association, 7 W. Madison St., Chicago, Ill. and/or The Rubber Manufacturers Association, 444 Madison Ave., New York, N. Y. at 50¢ per copy.

INDEX TO ATOMIC ENERGY COMMISSION'S REPORTS TO CONGRESS, 40-page index to first nine semi-annual reports of AEC which presents progress accounts of major programs from its establishment in January 1947 to January 1951; the last six reports review specific fields of AEC operations. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. at 20¢ a copy.

MEETINGS . .

Natl. Soybean Processors Assn., annual meeting, Edgewater Beach Hotel, Chicago, August 16.

Tanners' Council of Amer., annual meeting, Waldorf-Astoria Hotel, New York, N.Y., August 21-22.

Amer. Pharm. Assn., Statler Hotel, Buffalo, N.Y., August 26-31.

Summer Symposium, Nuclear Energy Development, annual meeting, Oak Ridge, August 27-September 7.

Amer. Chem. Soc., Diamond Jubilee Meeting, New York, N.Y., September 3-7.

Natl. Agric. Chems. Assn., annual meeting, Essex & Sussex Hotel, Spring Lake, N.J., September 5-7.

Amer. Soybean Assn., annual meeting, Fort Des Moines Hotel, Des Moines, Iowa, September 6-8.

Natl. Instr. Conf. & Exhibit, Sam Houston Coliseum, Houston, Texas, September 10-14.

Amer. Inst. of Chem. Engineers, Sheraton Hotel, Rochester, N.Y., September 17-19.

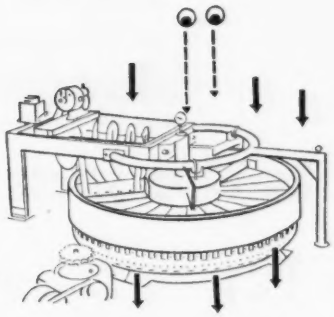
Conf. on Ind. Experimentation, Columbia campus, Columbia Univ., New York, N.Y., September 17-21.

Natl. Mineral Feeds Assn., annual convention, Bismarck Hotel, Chicago, Illinois, September 18-19.

Food, Drug & Cosmetic Law Div., Amer. Bar Assn., annual meeting, New York Univ. Law Center, New York, N.Y., September 19-20.

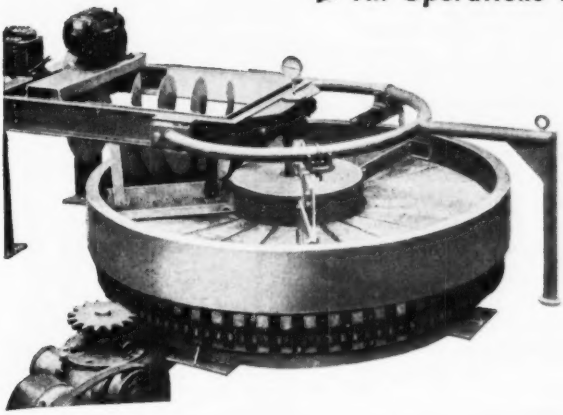
Drug, Chem & Allied Trades Sect., New York Bd. of Trade, annual meeting, Shawnee-on-Delaware, Pa., September 20-22.

OLIVER
HORIZONTAL
FILTER



▶ *All Flow Downward*

▶ *All Operations Visible*



YES, with the Oliver Horizontal Filter, gravity aids the flow at all times and the attendant can see what's going on. He's looking down on a horizontal surface and can watch the feed pour onto the filter and the cake form. He can get better washing because the wash has a more blanketing effect and is under better control. And, if desired, washes can be kept separate by means of the multi-outlet valves.

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Antibiotics
Silica Gel
Salt Tailings from Potash Recovery
Crude Sodium Chloride
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is the least corrosive!

The accompanying graphs show the relative corrosion rates of six of the most widely used mild acids when tested on Monel metal, stainless steel, copper, aluminum, zinc and mild steel. The metals were immersed in 1 N acid solutions for 4 hours at 212°F. In each case, gluconic acid was found to be *the least corrosive of all!*

Because of this mildness, gluconic acid is widely used in metal cleaning compounds. Being non-toxic, it is particularly effective in cleaning agents used by the food industry. And in brewing, it is finding increasing use in the prevention of beerstone formation.

Gluconic acid is also used as an acid catalyst for vat soluble ester printing pastes and acid colloid resins in the textile industry. In addition, it is an effective sequestering agent in textile printing, tanning and industrial water treatment.

Gluconic acid is marketed as an amber, 50% aqueous solution possessing a slight acetous odor. Specific gravity is 1.24 at 25°C.

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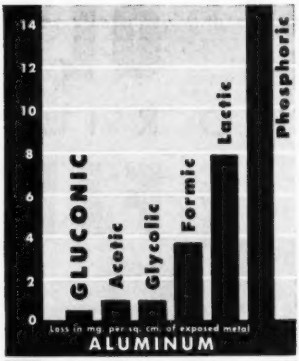

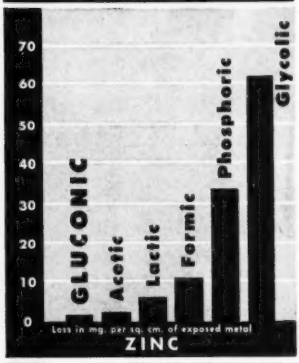

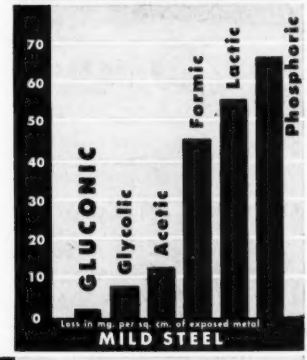

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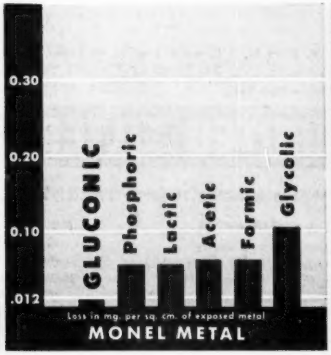
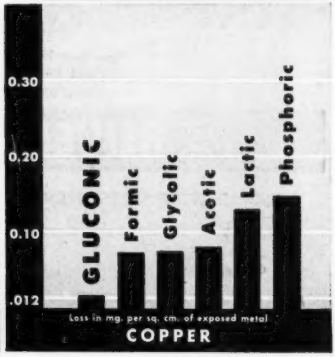
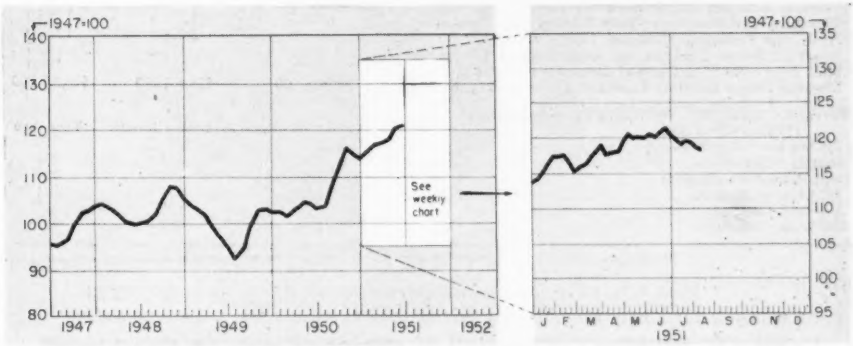




CHEMICAL MARKETS....



CHEMICAL INDUSTRIES OUTPUT INDEX — Basis: Total Man-Hours Worked in Selected Chemical Industries

This year, the month of August may seem interminable to the chemical industry. Reason: the Office of Price Stabilization's new pricing edicts will give sales executives plenty of figuring to do. This is what the OPS came up with this week:

Established August 13 filing date for manufacturers under CPR-22, permitting more cost increases, fewer rollbacks.

Set markups for chemical imports and exports under CPR-31 and CPR-61 to near pre-Korean levels.

Issued tailor-made price ceilings for exports of fats and oils, and for all sales of anti-freeze and lube oils.

At the same time the OPS acted this week to speed the flow of widely-used sulfur, soda ash, and phosphate rock from the Gulf Coast to Atlantic ports and thence to industrial channels. Purpose: to keep coastwise shippers from being lured into foreign commerce. The higher freight cost may soon be reflected in higher prices for several chemical products.

The outcome of these pricing actions will be to end much uncertainty among makers and sellers of chemicals. Price ceilings will be definitely higher than the OPS had planned prior to the rise of Congressional opposition.

But in the generally improved supply picture of today's market, many of the ceilings are well above what the consumer is now paying. While more production goes on stream, without a corresponding upswing in demand, more thought is given to price floors than to price ceilings.

The resale market is a notable case in point. Ceiling prices among resellers were established during the peak of the chemical shortages in January. Now the supply and demand are in much better balance, and resellers are singing the blues as prices keep skidding.

Only a few exceptions to this trend are apparent: DDT, phthalic anhydride, sodium bichromate, and a few pharmaceuticals.

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947=100)	119.0	118.7	107.2
Bituminous Coal Production (Daily Average, 1000 Tons)	1,704.0	1,718.0	1,786.0
Steel Ingot Production (Thousand Tons)	2,021.0	2,029.0	1,927.0
Wholesale Prices—Chemicals and Allied Products (1926=100)	139.8	138.2	120.5
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	251.1	246.6	178.0
Chemical Process Industries Construction Awards (Eng. News-Record)	$25,885,000	$34,451,000	$16,997,000

MONTHLY BUSINESS INDICATORS — Production (1935-1939=100)	Latest Month	Preceding Month	Year Ago
All Manufacturing & Mining	222	223	199
Durable Manufactures	276	276	237
Non-Durable Manufactures	197	198	184
All Chemical Products	303	298	261
Industrial Chemicals	550	538	451
By-Product Coke	176	178	170

Most U.S. Chemical manufacturers are counting on operating at capacity for a long time, despite trends in the resale market. Caustic soda and soda ash are frequently cited by resellers as notable examples of softening supply.

But manufacturers believe that caustic will remain tight on the domestic market at least until the year's end. Soda ash is definitely easier from any angle and shipments are now moving against current orders.

Next year supplies of both alkalis should be more plentiful as whopping NPA-approved boosts in chlorine capacity bring in added supplies of caustic perforce. Whether domestic business plus stepped-up exports can siphon off the new production is the $64 question for alkali makers.

Heavier demand for sodium silicate and silica gel will help absorb at least part of the expanded alkali output. Major producers, Philadelphia Quartz and Diamond Alkali, are both embarking on facilities expansion to meet the need for petroleum catalysts and for detergents.

Plastics demand continues to stay well ahead of supply for most types. Current pinch may worsen if metal shortages under the CMP program lean strongly on plastics for replacement.

Plastics production reported by the U.S. Tariff Commission in the latest available figures show demand holding up well in almost all categories. Styrene molding materials output was 22.1 million pounds in May compared to the 20.4 million pounds for April. Vinyls and alkyds are both hovering near recent peaks. Only significant decline, urea and melamine resins, in applications for adhesives, textile-treating, and protective coatings.

At least two companies are betting on higher vinyl needs in the future and showing their interest with hard cash. The two, Goodrich at Calvert City, Ky., and at Pasadena, Texas, the neighbor-combination of Diamond Alkali-Shell Chemical.

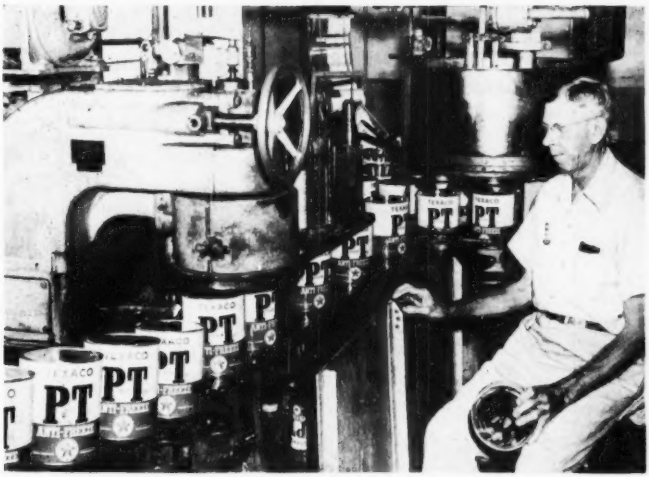
Overseas demand gets high priority from the office of International Trade, even for short-supply items. Producers of DDT have been notified that about 20% of August's output may be pre-empted by rated export orders up to a maximum of 15 million pounds.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending August 6, 1951

DOWN

	Change	New Price		Change	New Price
Carnauba Wax, No. 1 Yellow	$ .02	$ 1.19	Tin	$ .03	$1.03
Quicksilver, flask	6.00	204.00	Tung Oil, imported, tanks	.005	.355
Rosin, WW, Savannah, cwt.	.15	8.25	Turpentine, Savannah, gal.	.02	.675

All prices per pound unless quantity is stated



GLYCOL ANTI-FREEZE: Motorists hope for a permanent improvement.

Anti-Freeze Turnabout

Record glycol production boosts supply for coming-up anti-freeze season, motorists' prospects best in decade.

Methanol demand forges ahead of banner output, will squeeze many economy-minded anti-freeze buyers.

Of the 85 million gallon market, glycols take 50-55%, methanol 40%. Prediction: future pattern changes will be minor.

Because of anti-freeze shortages, especially of glycol, many late-season customers in the past found themselves in the same spot as old Mother Hubbard's dog: The dealer's shelves were bare. But this year the pattern for a fair distribution of anti-freeze for the coming season has already been pretty well set, and most of the canning for the season has been completed.

Dealers and distributors are aware of a trend toward the use of permanent anti-freeze made from high-boiling glycols in preference to the more volatile alcohol-based product. This season, though, they may find that the glycol type is more available than alcohols.

More Riders: The automotive anti-freeze business is a big one and growing bigger each year. Every new car is a potential customer, and each year something like 6 million new cars are adding to the highway traffic. Most anti-freeze market research men figure on something like 2 gallons of anti-freeze for each car, and that's an 85-90 million gallon a year business.

Of this automotive melon, glycol has been taking a larger share until today it holds about 50-55% of the total volume, gallon-wise. But the sales value of glycol is much higher relatively. Last year, ethylene glycol was generally selling retail for around $3.50 a gallon, methanol at $1.25-150 in the same quantity. This week, the Office of Price Stabilization fixed a $1.50 ceiling for methanol, and allowed a 25¢ a gallon boost for glycol.

About-Face: To beleaguered suppliers of anti-freeze to the retail trade, the relative abundance of glycol compared to methanol is somewhat startling. Many of them have in the past had to use considerable ingenuity to explain the glycol shortage to a would-be glycol customer. This year similar explanations may be in order for those who prefer methanol.

This is not to say that either type will be abundant. Spot shortages will still arise in many areas. But generally, the black-marketing this winter will be only a shadow of its former self.

Glycol to Flow: To help meet the heavy demand of the car-owning public, has been the objective of ethylene glycol makers for years. The result: some of the big producers have got bigger, and some prospective makers are also moving into the field. Kingpin in this business is Union Carbide and Carbon Corp. which completed a large-scale expansion in 1950 of facilities to make Prestone anti-freeze. Next in size are E. I. duPont deNemours & Co., Inc. and Dow Chemical Co. Dow is expected to bring in a sizable increase from expanded facilities at Freeport, Texas. Within the last few years, Wyandotte Chemicals Corp. and Jefferson Chemical Co., Inc. have both marked their entry into this field.

Sometime this winter, Mathieson Chemical Corp. is slated to go on stream make glycol at Brandenburg, Kentucky. The stock: light hydrocarbons recovered from the cross-country gas transmission pipe line. Hancock Oil Company in Long Beach, Calif. may also get into the producing picture, if a recently granted certificate of necessity is any criterion.

How Much To Come: These glycol makers are responding with zest and dispatch to the booming consumer market. From an output of 440 million pounds in 1949, and 510 million pounds in 1950, production capacity prior to Dow's expansion is estimated around 600 million. By early 1951, capacity will surpass 700 million pounds yearly.

Alcohol Backers: To make any further gains among anti-freeze consumers, may prove a tougher job. Many buyers are convinced that alcohol is perfectly suitable for the purpose, and besides it's a lot cheaper to install for the same freezing protection. Among the alcohol anti-freezes, methanol is by far the largest seller, pre-empting around 80% of the non-permanent type demand.

But methanol is becoming harder to coax into the anti-freeze market when there are so many other demands for it. Even with a 30% capacity increase since 1950, and production around the 1.2 billion pound a year bracket, the gap between supply and demand widens.

Another big outlet for methanol is formaldehyde, indispensable ingredient for resin making with phenol and urea-melamine. Other uses of smaller volume are growing with great speed: penta-aerythritol and hexamine. Besides, DuPont even uses formaldehyde to make its ethylene glycol and anti-freeze, Zerex, via the glycollic acid

With this demand, methanol makers are not unduly concerned over the inroads of glycols on the automotive domain. Some companies, still less perturbed, are making both products . . . for safety's sake.

Benzene in Focus

The chaos that has characterized the benzene supply picture for the past two years is giving way before a semblance of order. Principal factor: huge imports from Europe, principally from Great Britain. But imports are a very uneasy base upon which to carry the large, high-priority benzene-consuming industries.

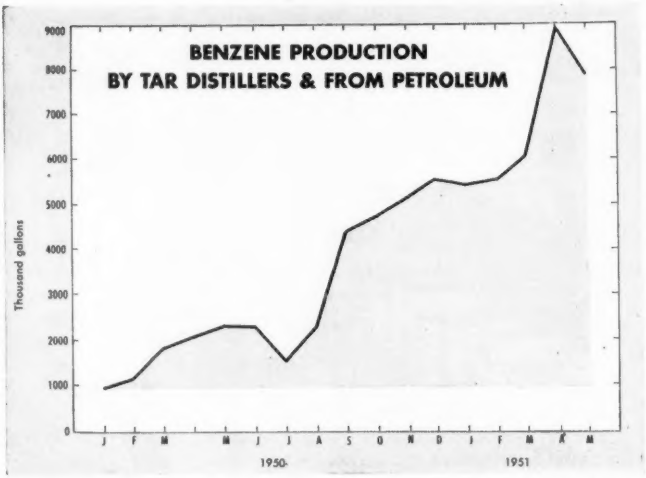
Realization of this fact has led to the issuance of certificates of necessity valued at approximately $70 million to build new facilities for manufacture of aromatic hydrocarbons—mostly benzene—from petroleum. L. A. Schlueter, of the Aromatic Chemicals Section of NPA, has estimated that by the end of 1952 petroleum will provide about 100 million gallons per year—nearly 60% of present production from the traditional source, coke ovens.

But Washington planners question whether even this huge figure will be enough to erase the need for imports and also meet additional supply demands created by the rapidly expanding phenol and styrene industries.

Prop: An idea of the prop supplied to benzene consumers by imports can be obtained from the accompanying graph, which shows "domestic" production of benzene by tar distillers (not coke manufacturers) and from petroleum as reported to the U.S. Tariff Commission. Prior to September 1950, output by this category of producers averaged about 2.0 million gallons per month. September manufacture jumped to about 4.5 million gallons and this figure has been expanding ever since until it reached almost 9.0 million gallons for April 1951.

The 7.0 million gallon-a-month difference is accounted for almost wholly by redistillation of imported benzene. Very little more benzene can be expected from coke ovens, and with one small exception there have been no added benzene-from-petroleum facilities placed onstream this year. Imports are the only remaining source that could supply such large quantities. Interestingly enough, the date of this first large increase, September 1950, coincides with the date when Monsanto and Dow began to have their imported benzene redistilled outside of the consuming plant.

Normal benzene production by coke oven operators, the major source of coal-derived benzene, is approximately 14.5 million gallons per month. Thus the added 7.0 million gallons represents approximately 30% of the total U.S. benzene supply of 23.5 million gallons per month.



Next Year: In 1952 more and more benzene will be provided by petroleum sources. This in turn will gradually lessen the dependence upon foreign benzene. But this supply will be at a price well above the present 30 to 37 cents per gallon quotations for coke-oven supplies.

GOVERNMENT NEEDS

Bid Closing	Invitation No.	Quantity	Item
Chief, Procurement Division, Supply Service, Veterans Administration, Washington 25, D.C.:			
August 20th	S-39	315700 lbs	Sodium metasilicate pentahydrate
Chief, Procurement Division, Supply Service, Veterans Administration, Washington 25, D.C.:			
August 15th	S-35	27900 lbs	Calcium hypochlorite
August 16th	S-36	80400 lbs	Laundry sour and blue
Commanding General, New York Quartermaster Procurement Agency, 111 E. 16th, New York:			
August 15th	52-44	835,000 lbs	Salt, Table iodized
August 27th	52-43	1,611,675 lbs	Sodium Orthosilicate

GOVERNMENT AWARDS

Item	Supplier	Location
Navy Department, Aviation Supply Office, Oxford Avenue & Martin's Mill Road, Philadelphia 11, Pa.:		
Enamel: Phenolic	Gillespie Varnish Co.	Jersey City, N.J.
Thinner: Cellulose nitrate, dope & lacquer	Robertson Co. Inc.	Louisville 10, Ky.
	Jones-Hamilton, Inc.	Oakland 1, Calif.
	Reliance Varnish Co.	Louisville 9, Ky.
Thinner, enamel, synthetic	Globe Solvents Co.	Philadelphia 20, Pa.
Navy Purchasing Office, New York, N.Y.:		
Disinfectant, germicide & fungicide, liquid form	Onyx Oil & Chemical Co.	Jersey City, N.J.
Insecticide Roach & Ant Control, Spray Dot Residual Effect	Wyandotte Chemicals Corp. Pacific Div.	Los Angeles 12, Calif.
Insecticide Powder Louse, Spray DDT Residual Effect	The J. R. Watkins Co.	Winona, Minn.
Insecticide DDT Emulsion Concentrate	Barco Chemicals, Inc.	Des Moines 15, Iowa
Insecticide Airplane Spray 20% DDT, DDT 100% Technical Grade	Stauffer Chemical Co., Nico-Dust Mfg. Div.	San Francisco 8, Calif.
	Thompson Hayward Chemical Co.	Kansas City 8, Missouri
Insecticide Airplane Spray, 20% DDT, insecticide Roach & Ant Control Residual Spray	Fluid Chemical Co. Inc.	Newark, N.J.
DDT 100% Technical Grade	Michigan Chemical Corp.	St. Louis, Michigan
New York Quartermaster Procurement Agency, 111 E. 16th St., New York 3, N.Y.:		
Trisodium phosphate	Blockson Chemical Co.	Joliet, Ill.
	General Chemical & Dye Corp.	New York City
Tablet, water purification, individual, iodine (50 tablets to bottle)	Abbott Laboratories	North Chicago, Ill.

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- Hi-Flash Solvent
- Phthalic Anhydride
- Dibutyl Phthalate
- ELASTEX* DCHP Plasticizer
- "ELASTEX" 10-P Plasticizer
- "ELASTEX" 50-B* Plasticizer
- "ELASTEX" 28-P Plasticizer
- Phenolic Resins
- Niacin (Nicotinic Acid)
- Pyridines
- Picolines
- Quinoline
- Lutidines
- Tar Acid Oils
- Neutral Coal-tar Oils
- Coal-tar Creosote
- CUMAR* Paracoumarone-Indene Resin
- Carbonex* Rubber Compounding Hydrocarbon
- Bardol* Rubber Compounding Oil
- Flotation Agents

*Reg. U. S. Pat. Off.

GET IT FROM...

Barrett

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

$1.20 a line, minimum 3 lines.
To figure advance payment count 5 average words as a line.

EMPLOYMENT WANTED and Individual Selling Opportunity undisplayed rate is one-half of above rate, payable in advance.

PROPOSALS, $1.20 a line an insertion.

INFORMATION

BOX NUMBERS count as one additional line in undisplayed ads.

EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED RATE:

The advertising rate is $8.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request. AN ADVERTISING INCH is measured 7/8 inch vertically on one column, 3 columns—30 inches to a page.

C. W.

NEW ADVERTISEMENTS received by 10 A. M. August 15th at the New York Office, 330 W. 42nd St., New York 18, N. Y. will appear in the August 25th issue subject to limitations of space available

---

"CONSOLIDATED"

BUYS—SELLS
USED MACHINERY
AND EQUIPMENT
FOR THE CHEMICAL
AND PROCESS INDUSTRIES

Including Paint, Food, Rubber, Plastics, Sugar, Drugs, Cosmetics and Allied Fields. From a single item to a complete plant.

CASH FOR YOUR IDLE EQUIPMENT.

CONSOLIDATED PRODUCTS COMPANY, INC.
14-18 Park Row, New York 38, N. Y.
BArclay 7-0600

EXCEPTIONAL GOOD BUY FOR IMMEDIATE DELIVERY

J. H. Day S.S. Double Arm, Sigma Blade, Jacketed Mixer, With Vacuum Cover, 5 Gal. Working Capacity, Like New.

WHAT HAVE YOU FOR SALE?
Call SOuth 8-4451 - 9264 - 8782
You Can BANK on

EQUIPMENT CLEARING HOUSE, INC.
289-10th ST., BKLYN 15, N. Y.

MIXER

Converted Day Mixer completely rebuilt and used not quite 2 years; 30 H.P. motor, 1 ton capacity; any type, powder or granulated chemicals; complete with cyclone exhaust system; cost over $5,000 to install. Accept any reasonable offer.

PHILLIPS MANUFACTURING COMPANY
3475 W. Touhy Avenue
Chicago 45, Ill.

REPRESENTATIVE AVAILABLE

I would like to sell your product either in the Los Angeles or Atlanta territory. Thoroughly familiar with each.

RA 1444 Chemical Week
330 W. 42nd St., New York 18, NY

FMC

GEAR UP FOR BIGGER PRODUCTION WITHOUT DELAY

GOOD USED EQUIPMENT
Ready for Immediate Shipment

It's impossible to List in this space the 5000 Machines available from your FIRST SOURCE

Send for our Latest List

FIRST MACHINERY CORP.
157 HUDSON ST.
WOrth 4-5900
NEW YORK 13, N.Y.

1—Illinois Water Treating System, 500 GPH flow rate, complete with Zeolite tank, etc.

1—Steel Bubble Cap Column 30" dia. x 62 plates high, with dephlegmator, condenser, cooler, etc.

1—Horiz. Steel Vacuum or Pressure Cooker, 3,000 gal., 6' dia. x 14' long, horiz. agitator, 25 HP motor.

6—Stainless Steel Kettles, 20# jacket, vert. agitator—2700 gal. & 950 gal.

PERRY EQUIPMENT CORP.
1415 North 6th Street
Phila. 22, Pa.

CHEMICALS WANTED

- Solvents — Pigments
- Intermediates, etc.

Highest Prices Paid

Aceto
CHEMICAL COMPANY INC.
62 BEAVER ST., New York 5, N.Y.
Digby 4-5760

—PROFESSIONAL SERVICES—

EVANS
RESEARCH AND DEVELOPMENT CORP.
Chemical Research ▶ Processes ▶ Products Development Problems
Complete Laboratory ▶ Pilot Plant ▶ Mechanical and Optical Sections
Ask for NEW Scope Sheet C listing over 100 of our activities.
250 East 43rd Street, New York 17, N. Y.

AT YOUR SERVICE

The recognized national medium for the disposal of used or surplus new equipment; for the advertising of positions wanted or vacant; of business opportunities, etc. are the

SEARCHLIGHT SECTIONS of

AMERICAN MACHINIST
AVIATION WEEK
BUS TRANSPORTATION
CHEMICAL ENGINEERING
CHEMICAL WEEK
COAL AGE
CONSTRUCTION METHODS & EQUIPMENT
ELECTRICAL CONSTRUCTION & MAINTENANCE
ELECTRICAL MERCHANDISING
ELECTRICAL WORLD
ELECTRONICS
ENGINEERING & MINING JOURNAL
ENGINEERING NEWS-RECORD
FACTORY MANAGEMENT & MAINTENANCE
FLEET OWNER
FOOD ENGINEERING
NUCLEONICS
POWER
PRODUCT ENGINEERING
TEXTILE WORLD
WELDING ENGINEER

for information on rates, etc., write
Classified Advertising Division

McGRAW-HILL PUBLISHING CO., INC.
330 W. 42nd St., N. Y. 18, N. Y.

READER SERVICE . . . . .

HOW TO USE COUPON

Circle page numbers of items about which you want more details. Then write your name and address on the coupon at the bottom of the page and mail it to us. Your request will be forwarded to companies concerned, the answer coming direct to you.

MAKES IT HANDY

Products and literature in this issue are listed on these pages. There are three indexes. (1) Editorial items on new products, new equipment, new literature; (2) products advertised. (3) The index of advertisers is on the following page.

THE NUMBERS

Advertisements:—There is a page number on the coupon for each advertisement. Before the number, may appear, L, R, T, B (left, right, top, bottom), locating the ad on the page; small letters following (a,b,c) indicate additional products in the advertisement.

Editorial Items:—Numerals are page numbers; the ABC's distinguish among items where more than one is on a page. There is a number on the coupon for each item referring to new products, equipment, and literature.

EDITORIAL ITEMS

For more data, circle number on coupon

NEW PRODUCTS

Diamino Diphenyl Sulfone 20C
Eastman Fast Blue GLF Concentrated 20A
Flavin Adenine Dinucleotide 20B
Resistojet 20D

NEW EQUIPMENT

Ammonia Canister 24E
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Lab Dishwasher 24B
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Storage Batteries 44F
Swivel Joints 44G

GENERAL

Controlled Materials Plan 44N

PRODUCTS ADVERTISED

For more data, circle number on coupon

Chemicals
- Aromatic 31
- Benzyl chloride 46
- Berez 30d
- Bicarbonate of soda T33a
- Carnauba extender or substitute, armowax 45c
- Caustic Soda 27
- Caustic soda and its derivatives for pulp & paper production 25b
- Chlorine and its derivatives for pulp and paper production 25a
- Coal-tar 41
- Dialkyl dimethyl ammonium chloride, arquad 2C 45b
- Ester gums 30c
- Fatty acids B32
- Fatty acids, neo-fat 3-R 45a
- Fungicides 28c
- Gloss oil 30f
- Gluconic acid 36
- Lithium compounds T34
- Lube oil additives 28g
- Maleic modified esters 30g
- Metallic stearates 28d
- Monohydrate of soda T33b
- Paint driers 28a
- Paint industry specialties 28b
- Phosphates 8
- Plasticizers 28f
- Potassium tripolyphosphate 1
- Propylene glycol, USP 2-3
- Rosins, limed 30b
- Rosins, pale wood 30e
- Sal soda T33c
- Shingle stain oil T32
- Solvents, petroleum 14
- Stabilizers 28e
- Sulfur dioxide, liquid 1
- Surface active agents, D-40 21
- Wetting agent, oil-soluble, alkaterqe-C 18
- Wood turpentine, steam distilled 30a

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READER SERVICE COUPON

Mail to Chemical Week, 330 W. 42nd St., N. Y. 18, N. Y.

NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

CITY & STATE _____

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Expires November 11, 1951

BOOKLETS . . . .

Chemicals

Ethylene Imine

24-p. folder dealing with ethylene imine, a compound showing much versatility in reactivity with potential uses in such major fields as the paper, textile, rubber and petroleum industries. Outlined here are pertinent facts concerning chemical and physical properties, chemical behavior, derivatives, physiological and biological properties, shipping and handling details plus application information. Chemirad Corp.

Cortico-Steroids

Bulletin entitled. "Fine Chemical Products Derived from Soybeans," describes cortico-steroids, cortisone and male and female sex hormones—available to physicians, chemists and research workers for both laboratory and clinical work. The Glidden Co.

Polymeric Resin

4-p. folder supplying information on the properties, formulation and performance of "Paraplex G-60," a polymeric resin which both plasticizes and stabilizes vinyl films; it finds application in vinyl lacquers, nitrocellulose products and chlorinated rubber formulations. Rohm & Haas Co.

Fish Oils

Technical bulletin covering heat polymerized fish oils along with copolymers, nondrying and miscellaneous oils, noting specifications and recommended uses—such as in flat paints, alkyd resins, rustproofing compounds, wood preservatives, etc. Archer-Daniels-Midland Co.

Equipment

Blast-Cleaner

22-p. illustrated bulletin featuring firm's blast cleaner, a tool with a vacuum pick-up used for obtaining a clean surface for painting, welding, metalizing, bonding rubber or plastic coatings; bulletin is divided into sections on operating principles, welding applications, equipment maintenance, plant maintenance, etc. Vacu-Blast Co., Inc.

Storage Batteries

56-p. revised edition of pocket-size handbook supplying technical instructions and engineering data on motive-power storage batteries contains sections on the theory of the lead acid storage battery, care and operation of batteries, maintenance repairs, component parts plus additional technical data. Gould-National Batteries, Inc.

Swivel Joints

18-p. catalog covering the company's line of ball-bearing swivel joints for use in multiple industrial and chemical applications; all swivel joints listed operate on the same basic principle in that all turning movement takes place on double rows of ball bearings. Chiksan Co.

Magno-Therm Oxygen Recorder

16-p. booklet featuring the magno-therm oxygen recorder comprising an introduction with an application table, an explanation of how an analysis is made, a diagramatic discussion of the recording section's operation, details on the gas sampling systems, plus a chart illustrating the results obtained in various installations. The Hays Corp.

Chain Drives and Conveyors

32-p. booklet discussing the installation, operation and maintenance of chain drives and conveyors with reference to care of sprockets, lubrication, inspection and storage, and adjustment and repair. Chain Belt Co.

Roller Conveyors

16-p. catalog covering a wide variety of roller conveyor types, giving selection data, roller mounting specifications and diagrams; use of roller conveyor in conjunction with wheel type conveyors is also discussed. The E. W. Buschman Co.

Oil Valves

4-p. bulletin featuring Micro-Cam oil valves to be used wherever manual or automatic regulation of oil flow is desired; included here are sectional view of valve, valve capacity table plus dimensional drawings of valves. Hauck Mfg. Co.

Dry Blenders

4-p. catalog devoted to firm's "Twin-Shell" laboratory dry blenders, explains the mixing principle by means of step by step illustrations and lists applications of blenders. Patterson-Kelley Co. Inc

Conveyor Belt Cleaner

4-p. bulletin on spring type mutiple-blade belt cleaner with roller type hold-back designed to prevent accidental reversal of loaded conveyors or elevators if power should fail. Stephens-Adamson Mfg. Co.

General

Controlled Materials Plan

25-p. manual. "Records Research Reports on CMP," outlines methods for obtaining the maximum in production efficiency by laying a foundation for the proper result by having a balanced and uninterrupted flow of materials to meet production requirements on schedule—thus long range production schedules are balanced with procedures which maintain control over every phase of manufacturing. Remington Rand Inc.

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San Francisco 4 ... Ralph E. Dorland, John W. Otterson, 68 Post St.

Boston 16 ..... 1427 Statler Bldg.

Detroit 26 ..... 856 Penobscot Bldg.

Pittsburgh 22 ..... 738 Oliver Bldg.

St. Louis 8 ..... 3615 Olive St., Continental Bldg.

ARMOUR *Chemical Division*

New process produces improved Neo-Fat 3-R for better alkyds

Armour's exclusive low temperature solvent crystallization process is not only the source of many new products, but it is also the key to improved products. An example is found in the case of Neo-Fat 3-R – a fatty acid with high linoleic acid content for better alkyds.

Lower Titer (only 5°C) provides a homogeneous product that insures uniformity in your alkyd formulations. Even in the winter, after outside storage, Neo-Fat 3-R requires a temperature of only 41°F to liquefy . . . thereby eliminating the necessity for a "hot room." And new Neo-Fat 3-R has an excellent color – Gardner 1-2.

Faster Drying—Alkyds formulated with Neo-Fat 3-R dry much harder and faster. A tack-free, air-dry film is formed in $1\frac{1}{2}$ hours . . . a maximum of H pencil-hardness is obtained in approximately 24 hours.

Non-Yellowing — Improved Neo-Fat 3-R is a superior fatty acid designed specifically for non-yellowing modified alkyd resin type enamels and varnishes. The high linoleic acid content and absence of linolenic acid makes solvent crystallized Neo-Fat 3-R an outstanding raw material for producing clean, long lasting whites.

Improved Neo-Fat 3-R is easy to formulate, easy to cook. Its excellent kettle behavior can be utilized in short, medium or long oil alkyd formulation.

Improved Neo-Fat 3-R is also applicable to paper-sizing compounds, for use in lubricants, printing inks, emulsions, etc. Generally speaking, in the resin field, Neo-Fat 3-R offers manufacturers a better raw material, uniform in color and fatty acid composition, and superior to natural oils in most respects.

New and improved Neo-Fat 3-R is available for prompt shipment in 55 gal. drums and aluminum tank cars. Write today for a sample of Neo-Fat 3-R – see for yourself what this superior solvent crystallized product can do for you.

Specifications Neo-Fat 3-R

	Min.	*Max.*
Iodine Number	140	143
Acid Value	198	202
Titer, °C	—	5
Color		
Lovibond – $5\frac{1}{4}$"	—	0.8R-8Y
Gardner, 1933	—	2
Unsaponifiable	—	0.5%
Moisture	—	0.5%
Appearance	clear	brilliant

Approximate composition

Linoleic Acid	60%
Oleic Acid	40%
Saturated Acid	trace

Arquad 2C kills bacteria and prevents corrosion in water-flooding systems

Since the introduction of water-flooding methods in secondary oil recovery, producers have had two major maintenance problems . . . *corrosion* of metal equipment and *plugging* of injection wells. Now, Armour and Company offers a new field tested product that answers both problems and is available at low cost. As little as 5 to 10 ppm. of Arquad 2C will check the growth of bacteria and give immediate, as well as residual, protection against corrosion.

Arquad 2C, a dialkyl dimethyl ammonium chloride, is a quaternary cationic surface active agent which protects metal in contact with corrosive waters by plating out as a thin film. Its powerful bactericidal properties have been verified by extensive laboratory and field tests. Arquad 2C is compatible with and soluble in all types of water, both fresh and brine – can be used in either acid or alkaline waters without danger of precipitation and is available for prompt shipment in 60% active solution in isopropyl alcohol.

Arquad 2C can help you maintain high water injection rates and obtain greater yields by controlling the formation of such plugging agents as corrosion products and bacteria. Arquad 2C is especially engineered for your use in secondary recovery pressure maintenance, and water disposal operations.

Write today for complete information, engineering service or consultation.

New hard high melting wax excellent Carnauba extender

With the cost of Carnauba wax running around $1.30 per pound, manufacturers are looking for reliable and economical substitutes and extenders. In many industrial applications a satisfactory solution to this problem has been found by using Armour's Armowax.

While Armowax is not the equivalent of Carnauba, it is in the hard wax classification. Armowax is made entirely of domestic materials and because it is a synthetic chemical it can be controlled to give a constant quality product.

Armowax is a brittle, conchoidal fracture, high-melting nitrogen-containing synthetic wax. It is resistant to acid and alkalis, has a light tan color and an acid value of approximately 10. Armowax has approximately the same penetration as Carnauba. Its melting point is 132°C, its Saponification Value is approximately 17 and its Flash Point is 250°C. Armowax is soluble in oleum spirits, Stoddard solvents, VM&P naptha, turpentine, butanal, methyl or butyl cellosolve, toluene, and xylene at elevated temperatures. At room temperature, Armowax has limited solubility in most common solvents.

Because of its versatility in many non-polish hard wax formulations, Armowax can often be used as either a substitute or extender for Carnauba – particularly in industrial applications. Its availability and extremely low cost have already been used to advantage by many manufacturers. Write today for samples and additional information. Armowax is also available in powdered form at slight additional cost.

Mail this Coupon

Please send additional information on

- .....
- .....

Name..... *Title*.....

Firm.....

Address.....

City..... *Zone*.... *State*.....

ARMOUR *Chemical Division*

Armour and Company

1357 W. 31st St., Chicago 9, Ill.

HEYDEN

BENZYL CHLORIDE

FINE HEYDEN CHEMICALS

Benzyl Chloride is an unusually versatile intermediate which is finding use in an increasing number of manufacturing processes. Whether your application is in pharmaceuticals, dyes, perfumes, quaternary ammonium compounds, resins or plasticizers, Heyden Benzyl Chloride will more than meet your requirements for quality and uniformity. It is produced in refined and technical grades, and is shipped in nickel drums or carboys.

Heyden's leadership in the chlorination of toluene and the production of chlorinated aromatics dates back more than a quarter of a century. Research chemists and production engineers will want to investigate the chloro derivatives of benzyl chloride in syntheses similar to those mentioned above. Typical of other interesting and useful Heyden chlorinated products are the chlorobenzoyl chlorides and the ortho-chloro derivatives of toluene, benzaldehyde, benzotrichloride and benzoic acid.

Write now for samples and further information.

OTHER HEYDEN CHLORINATED COMPOUNDS

- **Ortho-Chlorobenzoyl Chloride**
- **Para-Chlorobenzoyl Chloride**
- **2,4-Dichlorobenzoyl Chloride**
- **3,4-Dichlorobenzoyl Chloride**

- **Ortho-Chlorobenzaldehyde**
- **Ortho-Chlorobenzoic Acid**
- **Ortho-Chlorobenzyl Chloride**
- **Ortho-Chlorobenzotrichloride**
- **Ortho-Chlorotoluene**

HEYDEN CHEMICAL CORPORATION

393 SEVENTH AVENUE, NEW YORK 1, N. Y.

CHICAGO • PHILADELPHIA • SAN FRANCISCO

DETROIT • PROVIDENCE

Serving Industry Through Finer Chemicals

Benzaldehyde • Benzoates • Benzyl Chloride • Bromides
Chlorinated Aromatics • Creosotes • Formaldehyde
Formic Acid • Glycerophosphates • Guaiacols
Hexamethylenetetramine • Medicinal Colloids • Methylene
Disalicylic Acid • Paraformaldehyde • Parahydroxybenzoates • Penicillin • Pentaerythritols • Propyl Gallate
Resorcinol • Salicylates • Salicylic Acid • Streptomycin